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LECTURES ON COMMERCE

Lectures on Commerce

DELIVERED BEFORE THE
COLLEGE OF COMMERCE AND ADMINISTRATION
OF THE UNIVERSITY OF CHICAGO

Edited by
HENRY RAND HATFIELD

CHICAGO
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1907

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PREFACE

Higher commercial education has evidently gained a place in American universities from which it may never be displaced; yet he would indeed be a daring champion of the new curriculum who showed any confidence in prophesying just how the present tendency will finally crystallize, or just what its advantages will prove to be. But one unanticipated service has already been rendered. However much the caviler may object to the idea that the university can fit one for practical business life, he should nevertheless admit that the movement toward commercial education has at least the advantage that it brings the university man into closer contact with the man of affairs. If it cannot train for business, the university can at least be itself educated by the business man, who brings new points of view, fresh intellectual vigor, helpful criticisms, and, at times, stimulating errors—all of which serve to shake the academician in his loyalty to dogma, or at least to lead him to examine anew its title to sovereignty. Surely economists cannot forget the debt they owe to Ricardo the stockbroker, to Newmarch the banker, to Bagehot the editor, to Brassey the contractor, to Montchretien the manufacturer, and to Gresham the merchant, each of whom has done much to repay to the science of economics the debt due her from the business world for services in explaining the conditions of material prosperity. And so today, instead of forming a close academic clique, the universities are honored by the men

of affairs who consent to burden their overcrowded hours by delivering addresses to the students in the commercial courses. The universities cannot but profit by this innovation, which must lead to more catholic views, to less intellectual arrogance, to a sounder nexus between theory and practice.

The University of Chicago has been especially favored in this respect. Situated in so great a commercial center, it has been able to invite men eminent in their callings. The response which has been received is shown by this volume of lectures, and the College of Commerce and Administration again expresses its gratitude to those who have so generously contributed their time to the common work of commercial education. Acknowledgment is also due to the *Atlantic Monthly* for permission to reprint the introductory lecture by Professor Laughlin.

It is regretted that the conditions of publication made it impossible to reproduce the photographs which were used by Mr. H. F. J. Porter to illustrate his two lectures on forging. This has in turn made it necessary for the author to abridge the text, which as printed in this volume, inadequately represents the lectures as delivered.

HENRY RAND HATFIELD.

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INTRODUCTORY LECTURE

HIGHER COMMERCIAL EDUCATION.

J. LAURENCE LAUGHLIN, PROFESSOR AND HEAD OF THE DEPARTMENT OF POLITICAL ECONOMY, THE UNIVERSITY OF CHICAGO.

In the Philosophical Transactions of the Royal Society in 1798, Sir George Shuckburgh-Evelyn, in a scientific discussion of weights and standards, ventured to introduce a table of prices. He felt obliged to apologize for this fall to a lower level, by saying: "However I may appear to descend below the dignity of philosophy in such commercial researches, I trust I shall find favor with the historian, at least, and the antiquary." This is but a hint as to the way in which the study of the practical affairs of life, even down to our own generation, has been regarded by the managers of the old-fashioned and stereotyped education; nor can it be said that we have fully escaped from this attitude of mind even at the present day.

The traditional college education of the past was intended only for certain of the learned professions, particularly the ministry. It is unnecessary to recall how universally, until our own generation, the backbone of a college training was made up of the non-resilient Latin, Greek, philosophy, and mathematics. These subjects remained the vertebræ of college education during the whole period down to the introduction of the elective system. When liberty of choice and an extension of the courses of study were introduced, they were regarded somewhat in the nature of a veritable surgical operation, of so serious a kind that

the doctors wagged their heads and wondered whether the patient would survive. Even Mr. Lowell, after his return from the court of St. James, was skeptical of the new banquet spread for unappreciative guests. I heard him telling, jocosely, in an after-dinner speech in Cambridge, how he met an acquaintance (of dubious standing), whose cheerful face and happy demeanor led him to ask the cause of such exuberant felicity. "Why," said the genial smiler, "I've discovered a way to make my fortune. We all know that the reason for the fine flavor of the wild duck is the wild celery on which it feeds. Now I propose to feed it to the domestic duck, and supply the market." Some weeks later, on meeting his acquaintance again, Mr. Lowell found him quite depressed and inconsolable. "Why are you looking so unhappy? I thought the last time I saw you that you were on the point of making your fortune with ducks. Wouldn't it work?" "No," was the reply, "the d——d things won't eat it."

But the elective system, which is now generally adopted by every institution having means to supply the expensive menu, was, after all, but the beginning of a recognition granted to what one might call the new learning. There had come into existence a growing body of new knowledge, especially in the fields of science, and, in addition, new problems were projecting themselves on the economic and political horizons. Insensibly, during the last twenty-five years, one new subject after another has crept into the university curriculum; and, with general acquiescence, each has demonstrated by trial its right to live as an accepted means of academic discipline. Indeed, the time has

long gone by when anyone would be inclined to question the value of modern science, economics, political science, and the like, as effective instruments for training the mind and creating the intellectual grip called for in efficient public service. They have been in the past placed on an equal footing with the subjects of the old curriculum, and have proved themselves in no respect inferior. Admittedly, economics would not give the same training, for example, as the classics; but it slowly dawned on the academic consciousness that the classics alone, even when added to philosophy and mathematics, were not a complete nor the only means of education. There are many sides to the mind, there are many persons with very different mental preferences and characteristics, and these variations bid for various studies to suit their several needs. Candid observers felt it to be but reasonable to admit that the old learning had been narrow and quite too limited to fit all sorts of students.

Naturally, the conservative elements intrenched in our institutions of learning saw through a glass darkly, and regarded the influx of the Picts and Scots of commercial life as a menace to culture; it was felt that the new learning had only revenue as its immediate purpose, instead of culture; that, as the old learning had been the means of bringing to successful fruition the great scholars of the past, to give up the old scheme of studies was to give up the accepted standards of scholarship. The other side contended that, as no scholar had ever had any but the old form of training, it was illogical to argue that it was the one safe system; no comparisons could be made with any other process

of development. Moreover, appeal was made to the fact that, if the aim of education was to cultivate intellectual grip and power, the subjects of the new learning had proved to be as good instruments of education as the old. In struggles with difficulties encountered in the new studies, the student could be taught—in fact, is being taught—the judicial spirit, the love of truth, the passion for learning, accuracy, and a sense of form, quite as effectively in the pursuit of any other studies. It was practically a question of applying the same good teaching to the new as to the old to obtain much the same admirable results. Hence, if the old and the new learning stood on an equal basis as regards cultural and disciplinary efficiency, it might with reason and justice be claimed that the new learning had in addition the great and preponderant advantage for the student of preparing him directly for the real problems in the practical life which he must live after leaving the university.

Yet the natural development of these new forces in our educational system has been impeded by a state of things in our institutions which is little short of startling. The discrepancy between the amount of force exerted and the limited amount of achievement may well give us pause. What is this situation which is of a nature so surprising? Why is the outcome so far short of what it ought to be?

By way of taking our bearings, let us try to get an objective view of our general educational attitude and of the direction in which we are moving. Much has been said, and justly said, of the splendid advances made in graduate study, and of the accompanying

higher standards of scholarship, which have been shown within the last few decades in our American universities. But what of this movement as touching upon the relations of the university to the public, especially as regards the professional work of the community? Great as is the improvement in scholarship, great as are the new foundations and endowments, it would be false to the facts not to be willing to admit that this enlarged machinery of the academic departments has, in its relation to the professions, practically been confined to the preparation of men and women for the single profession of teaching; that is, much the larger part of the enormous foundations of the extensive and splendid educational plants in the departments of liberal arts in this country are mainly given over to the formation of an advanced normal school for teachers in schools and colleges. Do not understand me as decrying the admirable results of general culture obtained (by such as find it) from these studies that have no professional object. Not all bachelors of arts teach, we admit; but for those who do not, and who enter a business life, it is by no means clear that the curriculum, beyond its cultural quality, gives them the training needed for their future careers. As a *pis aller,* any new graduate of moderate scholarship can enter teaching as a profession; but how many would have an equal efficiency in banking, or railway management, or trade and industry? Perhaps I may be thought to have confused non-professional with professional study; that I am really concerned with the work of professional schools. But the advanced work of the graduate schools in the general field of literature, arts,

and science has become without question practically a training course for professional teachers; and the undergraduate work has been very largely influenced thereby. Almost never does a man go on to the degree of master of arts or of doctor of philosophy who has any other aim than teaching. This is, undoubtedly, the situation of today. Consequently, the obvious question is raised whether, apart from training investigators, the present endowments of our universities are not applied out of all proportion to one traditional profession to the neglect of others as much or more important to the life of the nation.

Why not ask ourselves frankly this question: Cannot even the undergraduate work of the university be so ordered and taught that the youth of this land (who now pass from the high school to the counting-house) may obtain from the new courses, which they can be persuaded to take primarily as a means to fit themselves for active business life, the same general cultural gains as have been secured from the old courses? No one believes that the courses in law and medicine (that is, the scientific and biological subjects), simply because they have a professional aim, have no cultural effects. Indeed, if we could introduce the earnestness of the professional student into the undergraduate work, it would be a signal gain. Moreover, as previously shown, the subjects of the new learning have proved to be equal to those of the old in their disciplinary and cultural efficiency. Certainly the work done for the arts degree ought not to be monopolized for one special and limited constituency; since, without derogation of the needs and value of that constituency, the college

course should be assumed to have aims touching many more constituencies.

But when we pass from the college curriculum to that of the professional schools, the limitations of our educational system are even more apparent. Considering the actual work of the world, the means of preparation for it are sadly out of joint. It will be found, on a little reflection, that certain professions have in the past obtained recognition and munificent endowments quite as a matter of tradition and precedence, and not after a careful weighing of their importance relatively to other constituencies. The country now has well-supported schools for the training of men in war, medicine, law, and technology; but it is quite within the truth to maintain that no one of these interests has as much influence upon the actual work and welfare of the people as those connected with railways alone, to say nothing of the wider field of trade and industry. More than three-quarters of all the persons engaged in gainful occupations in the United States are occupied in agriculture, fisheries, mining, manufacturing, mechanics, trade, and transportation. The problems involved in the management, adjustment, development, and well-being of this preponderant mass of the active population of this country present altogether the greatest and most important tasks to be dealt with in the new century. Leaders and the public must be given instruction until they can think clearly on these subjects of everyday concern.

It goes without saying that, as the world moves on, new constituencies and new demands arise; but it is not the less our duty to readjust our educational forces

to the new needs. Indeed, the relationship of the university to the new learning is at once the most obvious and the most pressing educational question of the day. On general grounds it is self-evident that the university must be regarded as a trustee, holding its vast educational funds, not for one part, but for the whole, of the great public. This ceases to be a glittering generality, and assumes a new phase, when we recall that the greater institutions of the country have in nearly every case obtained their munificent foundations from those who have been successful in the walks of trade and industry; and yet, strange to say, these very institutions have in the past done little or nothing to prepare men for the very occupations from which they have obtained the actual means of existence. It is startling to think how little influence the universities of today have had in training the great men in the constituencies of banking, railways, insurance, trade and industry, diplomacy, journalism, and politics.

The nature of the new education which this wide-awake century demands of us might be illustrated, without going too much into detail, by referring again to only one of the constituencies above mentioned. It should be possible to distinguish between that which is purely technical and that which is mainly managerial. While a school of mechanical engineering is required to fit a man for the practical parts of railroading, there exists in that profession a far more important career for the man who is competent to direct the traffic, classify goods, fix rates, watch the coming financial depression, know the signs of coming prosperity, have insight into as well as experience with the questions

of labor and the relations of employers to employees, understand the duties as well as the privileges of corporations, and who has the masterly mind to devise and carry out great financial operations involved in the management of securities on a scale hitherto unprecedented. It may be said that such men are made, not educated; but, similarly, we admit that even a born lawyer must study the principles and precepts of jurisprudence in order to do his work. The duties of a railway manager could not be met by a man of purely technical or engineering training; he must be schooled mainly in the courses of legal, political, and economic science. In these departments there is as distinct a body of disciplinary material for the railway manager as there is in the courses of the law school for the lawyer. And just as in the best law schools the primary object is, not to give technical skill in drawing up papers or to furnish the detailed pleadings of the courts, but to train men to think, to apply precedents to particular cases—in short, to get legal grasp and power—so also, in the preparation for these practical professions, emphasis is to be put, not upon the technical details of subordinate and auxiliary processes, but upon the capacity to bring a seasoned and practical intellect to the management and conduct of great practical problems.

To take another illustration, a preparation for banking should not be a drill in technical bookkeeping, or teaching a messenger how to carry a bag of gold in safety from one institution to another. The essential purpose of education leading up to such a profession would be a training in the principles affecting the prob-

lems which necessarily arise in local, national, and international banking. There are principles of money and credit underlying these phenomena often not understood even by many bank officials. The man who has been taught how to approach such problems, to work out solutions, to apply power and grasp of large and important subjects, must, in the end, prove an infinitely better head of a bank than he who has come slowly forward from the window of an accountant or teller, and whose professional education has consisted of the chance events brought to his attention in the round of daily business. Men of this latter description will become accurate, steady, and useful to the institution in minor positions; but if promoted to high posts they will be found to know really nothing beyond the dry husks of their professional experience or a personal acquaintance with their constituency. The recruiting of high officials in this fashion accounts for the prevalence of so much lagging conservatism and ignorant timidity in regard to burning monetary questions of the day.

If these great divisions of our practical life have been slightly regarded by the universities, it must be charged up to the account of inertia and a failure to keep in touch with the intellectual demands of a changing world. Such a situation, once it has been called to the attention of a people who pride themselves on being shrewd and enterprising, must certainly appear amazing. But has this situation anything to do with our other question? Why has there not been more product from our educational tilling?

Doubtless many instructors in all the higher insti-

tutions of learning would be able to bear regretful testimony to a falling off in the high level of ability of those students who present themselves for graduate work. The explanation is not far to seek. If the fact be granted, the rut in which our university education has been traveling goes far to explain it. To the virile and enterprising spirits who are tempted by the great rewards of banking, railways, insurance, trade and industry, the universities have—at least not until very recently—offered no inducements. If their purpose, apart from general culture, be not to enter law, divinity, or medicine, where can they go for training except to schools of technology? And yet the engineering, chemical, mining, electrical, and similar courses are solely and properly technical. They cannot attempt to provide the managerial education demanded; nor has it been provided as yet. Therefore the result was to have been expected. If the college and graduate departments have used their advanced courses mainly to create professional teachers; if the endowed professional schools are only for clergymen, lawyers, doctors, or technologists—it follows as a matter of course that the powerful and ambitious youth of the land, who are drawn to the exploitation of our new resources, have little inducement to come to the universities. It is a matter of common remark that never before in our history have the undeveloped resources of the United States bidden higher for power, skill, and intelligence than now. Never in our history have the industries of our country yielded more enormous returns from the introduction of new methods, better organization, and high executive ability than now. To the men who

can officer these enterprises large material rewards are offered, and they are not likely to be less tempting in the future.

If, then, apart from affording general means of culture, the college and graduate work continue to be confined largely to preparing advanced teachers, it is evident that our universities will become more and more detached from the real world around them. Teaching,[1] and even the so-called learned professions, do not begin to hold out the inducements to capable young men which are offered by the new fields of active life. That this class of persons do not come up to the university for college work, because that work *per se* will not train them for their future careers, is a trite statement. But why should not the colleges and the graduate school offer them courses as useful to their purposes as are now offered to the professional teacher? This is the true way to bridge the chasm between gown and desk. It is to be hoped that in the end this process will help to remove from the minds of business men the old distrust of academic training, as well as from the minds of the academic class the condescending attitude toward men of affairs.

Provided it be convinced of its shortcomings, can the penitent university turn over a new leaf? Can it undertake to furnish the practical means of training men for the neglected professions? There is no question that it is worth doing; but is it practicable? Or

[1] Professor Münsterberg, in his remarkable article on "Productive Scholarship in America," in the *Atlantic* for May, 1901, has already shown why better men are not drawn toward teaching in the United States; but he has not gone into the reasons why the American universities do not attract the ablest youth as students.

should we fall back on the assumption that a course of so-called "cultural," non-commercial work is all in all the best foundation for active business life?

As to its practicability no new demonstrations are necessary. To the leaders of university policy—supposedly educational experts—is given the duty of deciding in detail upon the subjects, the methods of instruction, and the fitness of instructors. The task is partly a new one; but it is certainly no more difficult of execution than that which has already been met in working out the most efficient training for law or medicine. Many of the needed subjects have already found a place in the university class-room. Time and experience will bring changes and improvements in any original scheme of study.

Doubtless there is, or may be, a suspicion attached to the curricula of such a system, on the ground that "commercial" studies will lower the standard of scholarship and bring in an era of courses "for revenue only;" or that the classical and scholarly activities of the university will be submerged by an avalanche of students having only a material point of view. All these objections are more imaginary than real. As has been mentioned before, such subjects of the new learning as economic and political science have been for a quarter of a century gladly welcomed alongside the traditional classics, philosophy and mathematics; nor in all these years has it ever been suggested that these new subjects were not equally effective with those of the old learning in giving discipline and mental grip. They have established their right to live, not merely because they bear on the problems of the neglected pro-

fessions above mentioned, but because they are admirable instruments of culture; because they force men to think on the subjects with which they must deal in their professions; because (under good instructors) they cultivate accuracy of statement, precision, logic, the judicial spirit, the love of truth, and a sense of form. What more can be said of any other part of the accepted university work? Certainly these new courses will not have changed their disciplinary quality because they may be grouped and arranged as parts of an orderly system leading up to the industrial professions of our country.

Nor is there any ground, in my judgment, for supposing that the university would be submerged by a swarm of men having, not cultural, but commercial, aims. If the class who do not now come up to the university should be offered the advantages of the new education, of course the cultural gains for them must come out of the work which they must take primarily as a preparation for business. This new constituency will come to the university—if it comes at all—only because they can there get a genuine advantage over the untrained throughout their subsequent careers in trade and industry. Here in itself is a principle of selection which will act as a safeguard. Furthermore, if there is a present tendency for the most powerful elements of the community to go into business, then it stands to reason that, if such men are induced to come to the university for their training, the university will be the gainer rather than the loser. Anyone who has ever been in business knows that the mental force and power shown by men in that walk of life is in general

superior to that in academic life. In all justice, this class has as much—if not more—right to be considered as that engaged in teaching or any similar profession. This is the body of persons who would introduce new and vitalizing blood into the student community, much to the advantage of all. If there is any health in the old studies, they will hold their own in contact with the new; if the new constituencies are mainly recruited from origins characterized by force, while the old come from those of culture, students who come primarily for professional gains will carry away cultural results as well. The university will draw to itself new constituencies without losing the old ones; it will fit for all instead of for a few professions; it will bring force to the cultural elements and culture to the forceful elements. In a true sense, then, will an institution become a university, not merely because it teaches many things, but because it successfully fits its students to solve their respective problems in all parts of the life which they must live after leaving the university.

It may not be amiss at this point to give some typical courses of study already adopted in some of our universities.[2] Once admitted to the School of Commerce of the University of Wisconsin, the student is required to study, together with some general elementary courses, the Industrial History of England, History of Commerce, Business Forms and Accounts, Transpor-

[2] In addition to the three institutions here mentioned, courses similar to those above described have been introduced at the universities of Michigan and California. At Harvard "courses for business" are offered. In Germany, the University of Leipzig has gone in the same direction, although the more technical courses are given in the *Handelslehranstalt*.

tation, Banking and the Mechanism of Exchange, Business Organization and Management, Commercial Law, Economics, German, French, Spanish, and English, and the Generation and Transmission of Force. Then he may choose between the two fields of Banking and the Consular Service. For the former, he elects Money and Banking, History of Currencies in Modern Nations, Corporation Finance and Securities, and Crises; for the latter, he elects International Law, Commercial Geography of Europe, Diplomacy, the Consular Service of the United States and Foreign Countries. At the end of the course the degree of Bachelor of Commercial Science is given.

Passing the two-years' course in Business Practice and Banking, at the University of Pennsylvania, to the four-years' course in Commerce and Industry, it appears to be a scheme of work having a general object, rather than a separation into groups leading to special professions. The required subjects of the first two years include: English, French, German, Accounting, Economic Geography, Constitutional Law, Practical Finance, Business Law, Political Economy, Geography of Commerce, and Legislative Procedure. In the last two years twelve of the necessary sixteen hours a week may be elected from the following: Economics, American Commerce, Banking, Commercial Treaties, Corporation Law, Commercial Products, Industrial History, Economic Resources of Europe and the United States, Recent Changes in Industry, Legislative Problems, Finance, European Commerce, Colonial Government, Economic Resources of Tropical Countries, Causes of Industrial Supremacy, English Civilization, International Law, Race Traits, International Trade, Transportation, and Credits. The degree of Bachelor of Science in Economics is given.

At the University of Chicago the entrance requirements to the regular college work, including Latin, are demanded of the candidates for the College of Commerce and Administration. The work of the first two years is mainly that pursued in the general work of the college, including English, modern languages, mathematics, and science, with introductory courses in Civil Government, History, Sociology, Economics, and Commercial Geography. In the last two years the direct preparation for business begins, based on the general training of the past years in college and in the schools. Of the necessary eighteen units exacted in these last two years, seven are required and eleven are elective. The requirements include Principles of Political Economy, Jurisprudence, Constitutional Law, Europe in the Nineteenth Century, Recent American History, Psychology. The remaining eleven are chosen, under advice, as leading directly to Banking, Railways, General Industries, Foreign Commerce, Consular Service, and Journalism; and they are taken from the following list: (*a*) Theory of Value, Unsettled Problems of Distribution, History of Political Economy, Scope and Method of Political Economy, Statistics, Economic Factors in Civilization, American Agriculture, Tariffs, Industrial Development of Europe, Modern Industries, Economics of Workingmen, Socialism, Technique of Trade and Commerce, Colonial Economics, History of Commerce, Trusts, Transportation, Comparative Railway Legislation, Accounting, Money,

Banking, Financial History of the United States, and Finance; (*b*) History of Political Theory, Comparative Government, Federal Government, Government of Great Britain, France, and Germany, Government of Colonies, Federal and State Constitutional Law of the United States, Law of Municipal Corporations, Municipal Government, International Law, Diplomatic History of Europe and the United States, Roman Law, Law of Property, and Law of Persons; (*c*) American History (1789-1860), American Political Parties, the Renaissance, Europe in the Seventeenth and Eighteenth Centuries, the French Revolution and Era of Napoleon, and the Rise of Prussia; (*d*) Contemporary Society in the United States, American Cities, Development and Organization of the Press, the Family, Rural Communities, Contemporary Charities, Social Treatment of Crime, Structure of English Society, Philanthropy, Elements and Structure of Society, Municipal Sociology, the Sociological Conception of the State, and of the Problems of Modern Democracy; and (*e*) eleven courses of science, including Electricity, Physiography, Economic Geology, Mineralogy, Chemistry of Ore Deposits, Geographic Botany, etc. The degree of Bachelor of Philosophy is given.

The criticism raised in academic circles by the word "commercial" seems to imply a suspicion of unworthiness in the work of a school which is intended to prepare men for business. That all depends upon the kind and purposes of the new education. The essential aim of a college of commerce and administration should be, not technical, but disciplinary; it is not

intended, according to an obsolete theory of education, only to give useful information, but to give the knowledge of underlying principles and that mental grip which will provide the possessor with the capacity to meet comprehendingly a new problem, however suddenly it may arise; its function is not merely to impart technique, or a rule of thumb, which may at any time become obsolete, but to teach men to think in the affairs of their profession.

This educational attitude may be illustrated by reference to the profession of journalism. Much well-deserved sarcasm has been directed against the plan of establishing schools of practical journalism. If the plan meant solely teaching a student how to condense paragraphs, how to expand a sentence into a lurid column of description, how to interview an obdurate public character, or how to paint the page with the most striking headlines, then there is no better means of teaching journalists than the actual routine of the newspaper office. But this method is a receipt only for making hacks, not journalists. On the other hand, what is the right way? It is seen at once that the policy and influence of a newspaper depend upon whether or not it shows a masterly grasp of the political, economic, legal, and literary subjects which the public are thinking about. How can a man be prepared to deal adequately and powerfully with these matters? Certainly not by mistaking the shadow for the substance; not by caring for the envelope at the expense of the content. Good English form is essential—we assume that; but to be a journalist, and not a hack, a man must be trained to think logically and

clearly on all the subjects treated by the press. Otherwise he is as much out of place in an important position on a newspaper as a paralytic in an athletic contest.

The purpose of commercial education will not be met simply by knowing much about commerce; its success can be obtained only by realizing that piled-up knowledge is an unsteady monument unless braced and held true by an informing body of logical principles which have been understood and used by the builder. The distinction is an important one. Permit me to illustrate it. There may be two ways of teaching a mechanic how to build a steam engine: In one way, he might be given the measurements and plans for a specified engine, and by memory and imitation this one body of facts might be imprinted on his mind. The workman could build this engine, but no other kind. In another way, one might teach him thoroughly the laws of thermodynamics, the strength of materials, the principles of applying forces, etc.; and the workman, understanding the theory of the particular engine when expressed in one form for a given purpose, could readily adapt the same principles to another adjustment of materials, and make a different engine for a different purpose. The former system is the repetition of parrot-teaching; the latter is education.

If, then, one finds a system of commercial education which leaves out the fundamental requirements of training common to all proper schemes of developing the human mind; if it proposes to throw away the training instruments of admitted quality, and to carry commercial courses of a merely informational character down into the high school—then we have reason for criticism.

Commercial high schools carry the professional purpose down into the period usually given to the general disciplinary work of the secondary schools. So far as the courses for such schools are informational, and not disciplinary, they defeat the true aims of education. If the man of affairs should never get literary and cultural training even in the high schools, he would be worse off than he is now; and there would tend to arise more and more a class of narrow business men who would have little or no understanding of any other life than the pursuit of wealth. The establishment of such high schools, therefore, seems to be a response to the commercial ideals of the age—a means for the better technical equipment of our youth at the expense of that general knowledge which should be regarded as the necessary foundation for subsequent professional work. Money-getting should be accepted as a means to an end, not the end itself; training for money-getting should be thought of as secondary to the creation of superior tastes, qualities, and intelligence by which the higher things of life—things not to be bought by money—could be discovered and enjoyed.

In Germany, the overproduction of scholars has revealed the same existing tendencies as in our universities to emphasize the function of the university as a training school for teachers, even though many pass into the public service as well as into the learned professions. Means for the preparation of men for what I have called the neglected professions has not been provided by the universities (with the recent exception of Leipzig), but only by the technical schools. When

the educated German gets over his dread of the dehumanizing effects of subjects which are *praktische,* and his tendency to exalt that which has no commercial end (wholly apart from his splendid reverence for scholarship and research which has given imperishable renown to German learning, and which nothing should touch), we may expect to see the German university accepting the duty of preparing men for all the professions instead of for a few—and this without derogation of the highest standards of academic achievement.

When Bismarck attributed the success of his soldiers in the Franco-Prussian war to the fact that "each musket thought," he was merely expressing in one form the general principle which holds in the more peaceful contests of domestic and international competition of industry with industry. If we are ever to succeed in taking a commanding position in international commerce, it will be because our industrial and commercial education is based on the correct principle of educating men to *think,* and to work out and understand the principles which underlie all the active work of their professions. The ability to undersell foreigners in the international market is not a question of the bravery of our soldiers and sailors; it is not a question of the size of our army or the number of our battleships; it is not a question of physical force or blind Chauvinism; but it is a question whether the practical managers of our mills and workshops are capable of devising better methods than foreigners for hoisting our raw materials in a less expensive way from the mines; for transporting them with greater

dispatch and cheapness; and for transforming them into finished products with better machinery, with greater adaptability, and with greater skill than our competitors. Stereotyped methods will not avail; it will not do to tell a man how to perform a task today without at the same time teaching him, by a training in fundamental principles, how to think out a new and better method if a new adjustment shall be needed tomorrow. No rule of thumb can do the work. The object of education is to develop power and grip, not to give dogmatic precepts. The best training for practical life, therefore, is not to be found in that which is technical, but in that which is disciplinary. In industry, as in manners, we Americans have lived too much under the reign of "slouch;" in the future, under the stern demands of large industrial movements, the exact, the powerful, well-trained, and far-seeing man will inevitably displace the man of routine, narrowness, and mediocrity.

RAILWAYS

RAILWAY MANAGEMENT AND OPERATION.

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The purpose of a railroad may briefly be stated to be the safe and expeditious transportation or conveyance of persons and things from one place to another, all other considerations being subordinate or incidental to that purpose. To produce this result in a definite, systematic, reliable, and economical manner is the object of railway organization and the aim of the service. Notwithstanding the apparent simplicity of the purpose, the means required for its development are ponderous to a degree beyond that of any other industry, and the methods of administration are of a most complex order.

The ownership of a railroad is vested in the shareholders, who control the property through a Board of Directors, which they elect for the purposes of administration. The Board of Directors in turn elects the President, who as chief executive officer guides the administration and exercises all the powers of control and direction. To assist him in this responsible task, heads of departments are appointed, who have control of the active management. From this point the organization differentiates rapidly, the duties of the officers of the various ranks becoming less general in their scope and the extent of their territory correspondingly diminished, until finally their locations are fixed and their duties confined specifically to details, the capable

handling of which contributes so greatly to the success and efficiency of the management.

The principal departments of railway service are usually classed as follows: Law Department, Treasury Department, Traffic Department, Operating Department. The President as chief executive officer has authority in all departments. Upon large systems of railway the head of each of the principal departments named is usually a Vice-President, with jurisdiction limited to his own department. Each Vice-President is assisted by a corps of officials, in whom are vested the control and supervision of the varied affairs of the department.

The functions of the different departments are indicated in a general way by their names. The Law Department gives opinions on all matters upon which legal advice is required, draws mortgages, leases, bonds, contracts, or other papers, and has charge and control of all litigation in which the railroad is interested. The Treasury Department has charge of all funds and securities, the books, accounts, and records, and of the receipts and disbursements. The Traffic Department has charge of the passenger and freight traffic, the tariffs, the interchange of business with other railroads, and the commercial relations with the public. The Operating Department has charge of construction and the maintenance of the railroad, its equipment, the trains and stations, and of the personnel and discipline of the service.

It is the purpose of this address to treat mainly of the operating division, and specifically of the transportation department of the service.

Under the head of what is generally known as "operation" is included the administration of all the physical resources and activities of the property, and to accomplish this end most effectually the operating service is subdivided into the following departments: Road Department, Machinery Department, Transportation Department. The heads of the different operating departments report direct to the General Manager, who in turn reports to one of the Vice-Presidents. As there is, however, no fixed standard of organization upon the railways of this country, there are frequent variations from the general type here presented, made necessary by local conditions and circumstances, so that it is not unusual to find officers of similar titles performing different duties upon different railways.

The completeness of an organization will depend in a large measure upon the extent of territory over which the general officers have jurisdiction, and the density of the traffic. Roads of small mileage and heavy traffic will require as extensive an organization as a road of large mileage upon which the traffic is of moderate volume. The highest differentiation will be found upon those railroads which combine extensive mileage with heavy traffic of a varied character.

The general officers are those whose jurisdiction extends in one or more departments over the entire line of the road.

The Road Department is usually in charge of the Chief Engineer, who reports to and receives instructions from the General Manager. The function of the department is to construct and maintain the roadbed and track; the bridges, trestles, and culverts; the sta-

tion grounds and roadways, station buildings and platforms; warehouses, elevators, docks, and wharves; the shop buildings and engine-houses; the water-supply, pumping stations and tanks; the coal-chutes and storage bins for fuel; the turntables, cinder-pits, and the accessories necessary to make complete the fixed elements of the physical organization of the railroad. In the administration of his department the Chief Engineer must determine the standards of size, weight, form, and capacity required of all classes of track material, the design of bridges, the plan and construction of buildings, the arrangement of yards for the reception and departure of trains, the switching and storage of cars, the installation of interlocking and block signals, and the combining and arrangement of facilities at terminals of divisions and of the line so that the free circulation may be assured.

In this work he is assisted by a staff, adjusted to the extent of territory under his jurisdiction and organized usually along the following lines: One or more assistants with the drafting and clerical force, which administers the main office and constitutes his personal staff. This staff, subject to his personal supervision, makes reconnoissances, preliminary and final surveys of new lines, prepares specifications and estimates of cost, and has charge of all new work under construction. It also assists in the design of the standards established for the use of the department, and in the planning of yards and terminals, and has charge of the general records and statistics of the department. This staff consists of the following: an Engineer of Bridges and Buildings, who prepares the plans and specifications of

the new structures and has charge of their construction and renewal; a Signal Engineer, who has charge of the installation and renewals of the appliances used for block signals and interlocking; an Engineer of Maintenance of Way, who is in immediate charge of the work of maintaining the property to the required standard of efficiency, and who has general charge of the extensive force of men needed to make the necessary repairs to the roadway, track, bridges, trestles, culverts, buildings, waterworks, scales, and other structures, and of the working stock of material and supplies required for these purposes. To assist the Engineer of Maintenance of Way in the general discharge of his duties there are assigned to his staff a Superintendent of Bridges, a Superintendent of Waterworks, and a Master Carpenter, who have jurisdiction, each in his own line of work, over the entire road.

The Machinery Department is in charge of the Superintendent of Machinery or, as frequently designated, the Superintendent of Motive Power, who reports to and receives instructions from the General Manager. The function of the department is to prepare plans and specifications for the construction of locomotives and cars of all the different classes that are required in the service of the road; to establish standards that will secure uniformity and interchangeability of parts; to equip and operate the shops for repairs of locomotives and cars, and to maintain the working stock of material and supplies needed for the purpose; to inspect the locomotives and cars that are in service, and keep them in safe and efficient condition, withdrawing from service such as are found to be in need

of repairs; to inspect, in accordance with established rules, the cars received from connecting railways in the interchange of traffic, and to make adjustment of claims arising from damage and loss of cars so used; to employ the mechanics required in the various metal- and wood-working trades of the different shops, and the inspectors and laborers needed in other classes of the work; also, upon many roads, to employ the locomotive enginemen and firemen. The selection of capable men for the highly skilled work of this department and the maintenance of discipline therein is a duty requiring experience and judgment.

The Superintendent of Machinery upon large roads is aided in the management of his department by two assistants, one of whom usually is given jurisdiction in the locomotive department and the other in the car department. He also has on his personal staff a Mechanical Engineer, who is usually directly in charge of the drafting office, and is immediately concerned with the mechanical standards and devices used in the department. Where a special testing bureau does not exist, the Mechanical Engineer is frequently charged with the duty of conducting tests of materials and of the efficiency of locomotives.

The Transportation Department is in charge of the General Superintendent, who reports to and receives instructions from the General Manager. The function of this department is to conduct the transportation of passengers and freight in a safe, economical, and efficient manner; to assign the motive power so that it may be used to the best advantage; to distribute the cars for loading, and to move them promptly so that they

may be made to perform the fullest possible service; to keep a record of the movements of cars, and to make settlements with other railroads for the use of cars interchanged; to provide adequate station service so that proper accommodation will be afforded for the reception of passengers, the sale of tickets, and the checking of baggage; to provide for the reception and loading of freight, the preparation of way-bills to accompany the freight in its movement over the road, and the necessary arrangements at its destination to deliver the freight to the consignees, and to collect the charges for the service performed; to prepare time-tables, and provide rules for the safe and efficient movement of trains; to organize the personnel of the train and station service so that employees may be assigned with a proper regard for their skill and capacity to perform the duties required of them; to provide and distribute the fuel and supplies required for engines, trains, and stations; to provide adequate telegraph and telephone service; to care for injured passengers and employees, and to adjust claims arising from loss and damage to property; to guard and protect the property belonging to or intrusted to the care of the road; to exercise supervision over employees in the service, and see that proper discipline is maintained. The efficient administration of the Transportation Department comprehends the utilization of the fixed physical elements supplied by the Road Department, and of the movable physical elements furnished by the Machinery Department, by a highly trained organization of men skilled in the work of conducting train movements under all the varying conditions of weather, daylight, and dark-

ness, to the end of developing with certainty of result the safe and expeditious conveyance of persons and things from one place to another.

To assist the General Superintendent in this work, he is provided with a staff, consisting usually of one or more Assistant General Superintendents, who exercise all the powers of the General Superintendent necessary for the proper management of the several parts of the road which are under their respective jurisdictions; a Superintendent of Transportation, who has general charge of the distribution of the car equipment, its movement, and the records relating thereto; a Superintendent of Telegraph, who has charge of the management and maintenance of the telegraph and telephone lines and service, and of the distribution of standard time; a Chief Surgeon, in charge of the Surgical Department, which consists of Division Surgeons, with jurisdiction over divisions of the road, and Local Surgeons at the more important stations, in charge also of the Hospital Service, for the care of the injured, and of the examination of applicants for employment, to determine their visual power, color perception, and sense of hearing, and their general physical condition with reference to their fitness for the service; a Chief Claim Agent, who with a staff of assistants has charge of the settlement of claims for loss by fire, damage to property and live stock, and the adjustment of claims resulting from personal injuries; a Chief of Police, who has charge of the watchmen, and a corps of special agents to investigate pecuniary irregularities of the service, and to protect the passenger service and the property in charge of the road from the depredations of criminals.

The General Manager, as the head of the operating service, must co-ordinate the work of his several departments so as to develop harmony of action and unity of purpose. He must be in close touch with the Traffic Department, and adjust the schedules of the passenger and freight trains to meet the competitive and commercial conditions existing in his territory so as to serve conveniently and efficiently the local needs, as well as the requirements of through traffic. He must see that an adequate stock of materials and supplies is provided for maintenance and operating purposes, and that the work of the several departments is so adjusted in the course of each year that the highest condition of efficiency will be developed at the time that the demand exists for the heaviest service. He must control and regulate the expenses to conform to the revenues, and so judiciously direct the expenditures for improvements that immediate as well as permanent benefits may be realized. He must see that the working rules and regulations are strictly enforced, that the agreements as to wage schedules are rigidly adhered to, and, when differences of interpretation arise between the officers and the men, that the questions referred to him as arbiter are determined with judicial fairness and equity. He must maintain, along with strictness of discipline, such a recognition on the part of the working organization of his justness of purpose that confidence and harmony will prevail throughout the service —conditions essential to the highest degree of efficiency.

When a railroad exceeds three hundred miles in length, it is usually separated into divisions, and in

each department those officers whose jurisdiction is limited to a division are known as division officers. The length of a division is seldom less than one hundred miles, even in thickly populated sections of the country, while upon railroads traversing thinly settled districts with light traffic a division may include from five hundred to seven hundred miles of road. The division offices are usually located either at the most central or at the most important point on each division.

The most approved form of organization places the Superintendent at the head of the division forces and invests him with full authority in the Transportation, Machinery, and Road Department affairs of his division. The authority of the general officers of each department becomes focused in the Superintendent, and as their direct representative he exercises within the limits of his jurisdiction the executive functions of the head of each department. In respect to this concentration of authority the Superintendent becomes virtually the General Manager of his division, and his responsibilities correspond to the scope of his authority. This system gives great compactness to the division organization, and the large authority of the Superintendent, when well directed, is productive of high efficiency.

To assist him in this work he has a staff composed of a Train Master, in charge of the Transportation service; a Master Mechanic, in charge of the Machinery Department service; and a Road Master, in charge of the affairs of the Road Department. The division officials are in immediate charge of the extensive working forces employed in the maintenance of the roadbed,

tracks, fixed signals, bridges, buildings, and other structures; the locomotives, cars, shops, and engine houses; and the operation of the train and station service. The standards of maintenance, the train schedules, and the rules and regulations being established, it is their duty to see that the work is carried on along lines which the management adopts as the policy of the road. It is not their concern whether the policy be a wise or unwise one, nor are they held responsible for results, except in so far as the results are dependent upon the faithful and efficient performance of their duties. No other phase of the service presents such condition of incessant activity as comes within the sphere of the division officers. Their ordinary work by day and night, and in addition their emergency work whenever the necessity for it arises, demand on their part vigorous health, untiring industry, disregard of personal comfort, capacity to withstand fatigue, rapidity of recuperation, habits of sobriety, and a zealous ambition to overcome the obstacles and difficulties which they frequently encounter.

The Road Master must maintain the roadbed, track, bridges, trestles, and culverts in safe condition at all times for the movement of trains. Storm, flood, and fire only add to this obligation, and in such stress he must exercise the greater diligence that the movement of traffic may not be interrupted. The forces under his control consist of the mechanics and laborers employed in the erection and repairs of bridges and buildings, the maintenance of pumping stations for the water-supply, the repairs and renewals required for the maintenance of roadbed and tracks, the scales used for weighing

cars, and the apparatus used for interlocking and block signals. He is assisted in this work by Supervisors of Track, of Bridges and Buildings, of Waterworks, of Scales, and of Signals.

The Master Mechanic must not only maintain the general condition and efficiency of the locomotives, but in the season of heavy traffic—usually coincident with the severest weather—he must receive the engines as they come off the road, frequently in more or less disabled condition, have them cleaned, inspected, repaired, furnished with fuel and water, and made ready for service in the shortest possible time. The cars likewise require inspection and repairs, which must be made, if possible, without withdrawing them from service; and when that is unavoidable, they must be returned to service with the least possible delay. He is assisted by a General Foreman, with supervision over the different departments of the shops, in which there are other foremen immediately in charge of the machinists, the blacksmiths, the boiler-makers, the carpenters, the tinners, the painters, and the car repairers; a Foreman of Engine House, in direct charge of the inspection and running repairs of engines, their preparation for road service, the forces employed in this work, and of the enginemen and firemen who make up the engine crews; and a Storekeeper, in charge of the materials and supplies used in the shops and by the locomotives when on the road.

The Train Master must see that the trains are made up and run in accordance with the established schedules. When any interruption occurs, he must proceed at once to the place and arrange for the resumption of

service, and when serious detentions are likely to result, he must arrange to detour the important trains and pass around the place where the obstruction exists with the least delay, using the most available foreign lines of railway for the purpose. He has jurisdiction over the yards and stations, as well as the line of road embraced in his district or division. He must see that freight cars are properly distributed, and that they are promptly loaded or unloaded, and forwarded. He has direct charge of all the engine crews and train crews, and must know that they understand the rules and are otherwise qualified to perform their duties. He must give especial attention to the weight or tonnage of freight trains, and know that locomotives are loaded to their full capacity. He is responsible for the proper and safe movement of trains, and must see that all the rules, and the special instructions of the time-table, are strictly observed. He must give his whole time and attention to the service; his office is one which is never closed, his work never completed; days, nights, and Sundays are alike; the ceaseless movement of trains knows no ending. He is assisted by a Chief Train Dispatcher, in direct charge of train movements, the distribution of cars, the telegraph lines and operators, and the office records and statistics; and by a Yard Master at each place where there are yards in which trains are received and made up and where cars are switched and stored.

For purposes of train service, a division, when two hundred miles or more in length, is divided into districts, which are usually adjusted to the length of a freight run, approximately one hundred miles.

Freight train and engine crews are changed at the end of each district, passenger train crews run over two or more districts, while passenger engine crews generally change on each district. Engines are changed at the end of each district, although it is not unusual in passenger service and upon fast freight trains which have little or no way work to do, for the engines to run through over two districts, changing crews at district terminals. At each district terminal there is a yard for trains, with an engine-house, turntable, coal-chute, water-tank, and cinder-pit for the locomotives. Day and night forces are employed at such points to provide for continuous service.

Station service is organized quite apart from train service, although intimately associated with it. The person in charge of a station is known as the Station Agent, and where the business is sufficient to justify it he is assisted by a Telegraph Operator, a Ticket Clerk, a Baggageman, a Freight Clerk, and the necessary force of laborers for handling freight. In large cities the station organization becomes highly complex; the passenger and freight service is separated; departments take the place of individuals, and large forces of men are employed; but in principle there is no difference between the organization of a large and a small station, and in freight service the person at the head of the station force is known upon all railroads as the "Agent." The methods which prevail in the handling of passenger traffic, both in station and train service, are so well known that it is not necessary to refer to them here.

In freight traffic the station service is adjusted to

conform to the two methods which prevail in the shipment of freight, namely, full car loads and less than car loads. In the case of car-load freight, the shipper loads the car and the consignee unloads it, the railroad furnishing no labor for the purpose. Cars containing car-load freight are placed for loading and unloading on public tracks conveniently located and accessible to teams, or are delivered directly to the private tracks of the different industries. Less than car-load freight is delivered by the shippers at the railroad freight-house, where it is received and loaded into cars, and at its destination is unloaded and delivered through the freight-house to the consignees by the employees of the railroad. The tariff rates for car-load freight are much lower than for the smaller quantities shipped in less than car loads.

When freight is received, whether in car loads or in packages, it is weighed, either upon track scales or on warehouse scales, to determine the charge to be made and the weight, rate, and charges are entered upon the way-bill which accompanies every shipment of freight to its destination.

At the close of business for the day, the cars which have been loaded at large stations are gathered up by the yard engines and made into trains under the direction of the Yard Master, who computes the tonnage, and, when equal to the rating of the locomotive assigned, the train is delivered to the conductor with the way-bills, and is ready for its trip on the road. While the conductor is comparing the way-bills with the numbers and initials of the cars and checking the tonnage of the train, his brakemen have coupled the engine,

tested the air brakes, and examined the doors and seals. The conductor then compares his train orders with those held by the engineman, enters his time of departure on the station register, and gives the signal to start.

The movement of trains upon nearly all of the railroads of this country is now conducted under a code of rules formulated by the American Railway Association, and generally known as the "Standard Code of Train Rules." This code is recognized as the most approved practice, and in addition to its rules contains a series of definitions which explain so many of the terms used in railway service that they are given here complete:

Train.—An engine, or more than one engine coupled, with or without cars, displaying markers.

Regular Train.—A train represented on the time-table. It may consist of sections.

Section.—One of two or more trains running on the same schedule displaying signals or for which signals are displayed.

Extra Train.—A train not represented on the time-table. It may be designated as—

Extra—for any extra train, except work extra;

Work Extra—for work-train extra.

Superior Train.—A train having precedence over other trains.

A train may be made superior to another train by Right, Class, or Direction.

Right is conferred by train order; Class and Direction by time-table.

Right is superior to Class or Direction. Direction is superior as between trains of the same class.

Train of Superior Right.—A train given precedence by train order.

Train of Superior Class.—A train given precedence by time-table.

Train of Superior Direction.—A train given precedence in the direction specified in the time-table as between trains of the same class.

Time-Table.—The authority for the movement of regular trains subject to the rules. It contains the classified schedules of trains, with special instructions relating thereto.

Schedule.—That part of a time-table which prescribes the class, direction, number, and movement of a regular train.

Single Track.—A track upon which trains are operated in both directions by time-table or by train orders.

Double Track.—An arrangement of two tracks upon each of which trains are ordinarily operated in one direction by time-table or by train orders.

Siding.—An auxiliary track used exclusively for meeting or passing trains.

Yard.—A system of tracks within defined limits provided for the making up of trains, storing of cars, and other purposes, over which movements not authorized by time-table, or by train order, may be made, subject to prescribed signals and regulations.

Yard Engine.—An engine assigned to yard service and working within yard limits.

Pilot.—A person assigned to a train when the engineman or conductor, or both, are not fully acquainted with the physical characteristics or running rules of the road, or portion of the road, over which the train is to be moved.

Fixed Signal.—A signal of fixed location indicating a condition affecting the movement of a train.

The 129 rules of the code relate to standard time, time-tables, visible signals, audible signals, train signals, use of signals, classification of trains, movement of trains by train rules, movement of trains by train orders, and the forms of train orders. These rules and the forms of train orders must be thoroughly understood by every conductor and engineman in road service.

When a train starts out on the road, its movement is watched day and night by the operators at every telegraph office, and the time every train passes each station is promptly telegraphed to the train dispatcher,

who enters the time on a record known as the train register, which is kept constantly before him. At each station is a special form of fixed signal, known as the train-order signal, which is displayed to stop trains by direction of the train dispatcher, who is thus enabled to control the movements of trains and to communicate with them when desired.

The movements of regular trains in both passenger and freight service are governed by the time-table, and so long as they keep on time they do not need any assistance to help them over the road. When, however, they become late, the train dispatcher's assistance is often required. In addition to the regular trains, many extra trains are run which are dependent entirely upon the orders issued by the train dispatcher for their right to proceed.

The fundamental principle of single-track practice in this country is that an inferior train must keep out of the way of a superior train, and the entire structure of the "Standard Code" is based upon that idea. Trains of the first class are superior to those of the second; trains of the second class are superior to those of the third; and so on; and extra trains are inferior to regular trains. The terms "passenger" and "freight" are descriptive and do not refer to class. First-class trains may be either passenger or freight, according to their importance. The class of a regular train is determined by the management when its schedule is established, and is shown upon the time-table. Usually passenger trains are first class, fast freight trains are second class, and slow freight trains third class. All regular trains are numbered, and are officially known only by their

numbers. The fanciful names which are sometimes given to trains have no place in the classification. All regular trains in one direction have odd numbers, and in the opposite direction even numbers. Extra trains are designated by the numbers of their engines and the direction in which they are moving. All trains in one direction are superior to trains of the same class in the opposite direction, the superior direction being specified upon the time-table. Regular trains hold their right and class for twelve hours; when over twelve hours late, they can proceed only by train order, and must then run as extra trains.

A train must not leave its initial station until it is ascertained whether all trains due which are superior or of the same class have arrived or left. A train must not start from a station until a signal to do so is given by the conductor. At meeting-points on single track between trains of the same class, the inferior train must clear the main track before the leaving time of the superior train. At meeting-points between trains of different classes, the inferior train must take the siding and clear the superior train by at least five minutes. An inferior train must keep at least five minutes off the time of a superior train moving in the same direction. Switches must be left set and locked for the main track after having been used.

The foregoing principles govern the movements of regular trains, and by their observance conductors and enginemen would be enabled to make their way over the road, were it not that extra trains are being continually run, for the movements of which provision must be made through the medium of train orders; in

addition to which occasions arise when it is of advantage to readjust the relations of regular trains, which is also done by means of train orders.

As it is of the utmost importance that train orders should be understood alike by all who receive them, the most stringent rules have been adopted to govern their issuance, transmission, delivery, and execution. There are thirteen standard forms of train orders, which are used for the following purposes:

Form A.—Fixing meeting-point for opposing trains.
Form B.—Directing a train to pass or run ahead of another train.
Form C.—Giving a train the right over an opposing train.
Form D.—Giving regular trains the right over a given train.
Form E.—Time orders.
Form F.—Sections.
Form G.—Extra trains.
Form H.—Work extra.
Form J.—Holding order.
Form K.—Annulling a regular train.
Form L.—Annulling an order.
Form M.—Annulling part of an order.
Form P.—Superseding an order or a part of an order.

The train dispatcher is the only person authorized to issue train orders, which are transmitted by telegraph and numbered consecutively each day, beginning with No. 1 at midnight. Each order must be given in the same words to all persons or trains addressed. Each train order must be written in full in a book provided for the purpose at the office of the train dispatcher, and with it recorded the names of those who have signed for the order, the time and the signals which show when and from what offices the order was repeated and the responses transmitted, and the train dispatcher's

initials. These records must be made at once, and never from memory or memoranda.

Train orders are of two classes, designated by the number of the form used and the color of the paper upon which they are written. The "31" train order is written upon yellow paper, is used to restrict the superiority of a train, and must be acknowledged by the conductor before it is made complete. The "19" train order is written upon green paper, can be used for any purpose except to restrict the superiority of a train, and does not require the signature of the conductor before it is made complete.

The specific requirements of the "Standard Code" as to the transmission of train orders are as follows:

To transmit a train order, the signal "31" or the signal "19" must be given to each office addressed.

A train order to be sent to two or more offices must be transmitted simultaneously to as many of them as practicable. The several addresses must be in the order of superiority of trains, each office taking its proper address. When not sent simultaneously to all, the order must be sent first to the superior train.

Operators receiving train orders must write them in manifold during transmission, and if they cannot at one writing make the requisite number of copies, must trace others from one of the copies first made.

When a "31" train order has been transmitted, operators must (unless otherwise directed) repeat it at once from the manifold copy in the succession in which the several offices have been addressed, and then write the time of repetition on the order. Each operator receiving the order should observe whether the others repeat correctly.

Those to whom the order is addressed, except enginemen, must read it aloud and then sign it, and the operator will send their signatures preceded by the number of the order to the train dispatcher. The response "complete," and the time, with the

initials of the train dispatcher, will then be given by the train dispatcher. Each operator receiving this response will then write on each copy the word "complete," the time, train dispatcher's initials, his own last name in full, and then deliver a copy to each person addressed, except enginemen. The copy for each engineman must be delivered to him personally by the conductor, and the engineman must read it aloud to the conductor before proceeding.

The requirements as to the "19" order are somewhat less exacting, as it is used only for inferior purposes. Trains must be stopped for "31" orders, but "19" orders may be delivered while trains are in motion. It is the duty of the train dispatcher to anticipate the necessity for train orders and have them ready for delivery immediately on arrival of trains. Three dispatchers are assigned to a district, each dispatcher working eight hours, then making transfer to the next, so that the service is continuous throughout the day and night. The successful operation of the train service is largely dependent upon the intelligence, skill, and judgment of the train dispatcher.

Of recent years more care has been exercised in the selection of men for the transportation department, and civil-service rules have been applied with much success to this branch of the service. Regulations as to employment and promotion are in effect as follows:

Applicants for employment must be of sound health, free from physical, mental, or moral infirmities, and produce satisfactory evidence of previous record, character, and ability.

Employees will be selected from applicants whose character, intelligence, physical capacity, and general appearance indicate that their services will be efficient and satisfactory, and who are likely to develop ability sufficient to merit advancement in the service.

For positions above that of laborer, no person will be employed who cannot read and write the English language, or who does not possess a knowledge of the rudiments of arithmetic.

Persons deficient in hearing, visual power, or color perception will not be employed in any branch of the service involving the use of signals or the movement of engines or trains.

All employees will be regarded as in the line of promotion, advancement depending upon their loyalty to the company's interests, faithful discharge of duty, and capacity for increased responsibility.

Examinations for promotion will be held from time to time, as may be required.

Examinations for promotion in train service will include: physical condition, rules of the Transportation Department, air-brake practice, and such special examinations as the regulations of other departments may require.

For promotion to position of conductor the applicant must have had two years' experience in train service, of which the last year shall have been in freight-train service.

Employees desiring promotion to conductors must make application in their own handwriting to the Train Master for examination, in which they must state their age, experience, and general qualifications for the position.

Applicants for the position of engineman must, in addition to the requirements of the Machinery Department, pass examination as to their physical condition, and on the rules of the Transportation Department.

Applicants will be examined in the order of their seniority, merit and ability being equal. Those who pass will rank in the service from the date of their examination on rules of the Transportation Department.

Applicants who fail on the first examination must within one year make written application for re-examination. Those who fail on the second examination will be dropped from the service. Flagmen, brakemen, or firemen who do not apply for examination within five years may be dropped from the service.

The object of fixing a limit of five years to the term of service of a flagman, a brakeman, and a fireman is

that these occupations are considered as preparatory training for the positions of conductor and of engineman, which are the fixed types of employment in transportation service; and a person who has not the capacity to qualify for either of these positions after five years of service is not likely to do so at any time, and should make way for those who are more capable and progressive. In respect to this regulation, however, the practice varies upon different railroads.

To the applicant who passes the examinations successfully the date of his principal examination is of considerable consequence, as it establishes his seniority rank in the service, and will thereafter affect his right to employment and to choice of runs, in the selection of which the men oldest in continuous service have preference. When it is considered that upon well-established roads a conductor or an engineman may have to serve twenty years in freight service before his turn comes for a passenger run, it is an object to gain promotion as early as possible in his career.

For many years the practice in railway service of administering discipline to those who after due investigation are found guilty of offenses requiring punishment was by reprimand, suspension without pay, fines, and dismissal. The practice of applying fines was discontinued some years ago, upon the theory that the principal sufferers from such penalties were the families of the men or those dependent upon them for support, who were in no wise responsible for their wrongdoing. Similarly, the practice of suspension without pay has more recently been to a considerable extent abolished, and in lieu thereof a system of record suspension inaugurated, which is found to be more humane, and as a deterrent fully as effective. Under this system the person at fault is given a suspension varying in length with the character of the offense, but, instead of losing actual time and pay, he is permitted to continue at work and the suspension is entered against his record. Should his record show in the course of time a series of suspensions indicating habitual carelessness, negligence, or incompetency, he is dismissed from the service. Provision is made, however, under this system, for extinguishing the unfavorable entries by periods of good conduct, so that in course of time a record may be cleared. A "clear" record is one in which all the unfavorable entries have been extinguished. A "perfect" record is one against which no unfavorable entries have been made. While the tendency at the present time is to exercise much forbearance, and to view with consideration those faults arising from errors of judgment as distinguished from those resulting from negligence, and in all cases to give the offender the benefit of a previous good record, there are certain offenses for which the capital punishment of dismissal must inevitably follow in order that discipline may be efficiently maintained, the principal one being intoxication on duty, for which no excuse is accepted.

Within the past two years a few of the leading roads of the country have adopted a system of pensions, for the purpose of enabling officers and employees who have rendered the road long and faithful service to retire when they have attained an age necessitating relief from duty. The most generous conditions governing retirement and the allowance of pensions, and

probably the best example of the railway pension system, are set forth in the following regulations:

The benefits of the pension system apply only to those persons who have been required to give their entire time to the company.

All officers and employees who have attained the age of seventy years shall be retired. Such of them as have been ten years in the service shall be pensioned.

Locomotive enginemen and firemen, conductors, flagmen, and brakemen, train baggagemen, yard masters, switchmen, bridge foremen, track foremen, and supervisors who have attained the age of sixty-five years may be retired. Such of them as have been ten years in the service shall be pensioned when retired.

Officers and employees between sixty-one and seventy years of age who have been ten years in the service and who have become incapacitated may be retired and pensioned.

In case an employee between sixty-one and seventy years of age claims that he is, or should his employing officer consider him, incapacitated for further service, he may make application or be recommended for retirement, and the Board of Pensions shall determine whether or not he shall be retired from the service. Physical examination shall be made of employees recommended for retirement who are under seventy years of age, and a report thereof, with the recommendation of the Chief Surgeon, shall be transmitted to the Board of Pensions for consideration in determining such cases.

The terms "service" and "in the service" will refer to employment upon or in connection with any of the railroads operated by the company, and the service of any employee shall be considered as continuous from the date from which he has been continuously employed upon such railroads, whether prior to or subsequent to their control by the company. [This regulation is especially favorable to the beneficiaries of the pension system, as it provides for continuity of service regardless of changes of management or of consolidation of railway properties.]

In computing service, it shall be reckoned from the date since which the person has been continuously in the service to the date when retired. Leave of absence, suspension, dismissal followed by reinstatement within one year, or temporary lay-off on account of reduction of force, when unattended by other employment, is not to be considered as a break in the continuity of service. Persons who leave the service thereby relinquish all claims to the benefit of pension allowances.

The pension allowances authorized are upon the following basis:

For each year of service an allowance of 1 per cent. of the average regular monthly pay received for the ten years preceding retirement. Thus, by way of illustration: If an employee has been in the service for forty years and has received on an average for the last ten years $100 per month regular wages, his pension allowance would be 40 per cent. of $100, or $40 per month.

When pension allowances shall be authorized, pursuant to these regulations, they shall be paid monthly during the life of the beneficiary; provided, however, that the company may withhold its allowance in case of gross misconduct on his part.

To the end of preserving direct personal relations between the company and its retired employees, and that they may continue to enjoy the benefit of the pension system, no assignment of pensions will be permitted or recognized.

The acceptance of a pension allowance does not debar a retired employee from engaging in other business, but such person cannot re-enter the service of the company.

The administration of the Pension Department is conducted by a board of officers of the road, including usually the heads of the different operating departments. This board has power, subject to the regulations, to determine the eligibility of employees to receive pension allowances and to fix the amount of such allowances.

The adoption of a pension system by railroads logically carries with it the adoption of a maximum age limit at which persons may enter the service; this limit is placed at thirty-five years.

The effect of the pension system, it is anticipated,

will be an advance in the general efficiency of the service by reducing the average age of employees, and thereby securing greater average capacity for the performance of duties which upon railways are so largely of a physical character. The attainment of this result, combined with generous provision for the aged and infirm, will, it is believed, commend the system to the approval of the public, which is so vitally interested in the development and continued improvement of methods of railway management and operation.

RAILWAY MAIL SERVICE: A HISTORICAL SKETCH.

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At the time our first railroads were opened the mail was carried on horseback, by sulkies, stages, four-horse post-coaches, packets, and steamboats. As the cities that could be served by steamboats were few in number, the expedition that could be given the mail was measured by the speed and endurance of the horse. In favorable weather, when the roads were in good condition, the mails were carried with fair dispatch, and were delivered promptly at the appointed time. During a portion of the year 1833 the express mail was carried from Philadelphia to New York, a distance of ninety miles, in six hours, at an average speed of fifteen miles per hour. But this, of course, was an extraordinary performance, and was only warranted by the disturbed and excited condition of public affairs that then prevailed. To maintain this speed the horses had to be changed every five miles. It was thus a relay race against time, with eighteen contestants. Two horses being needed to carry the mail, seventy-two horses were required for each day's service, with reserves to take the places of the disabled. The contractor received one dollar per mile run by each horse, a sum far in excess of the revenue received by the Post-Office Department from the mail carried.

The foregoing example presents one extreme. The

other shows the all but impassable roads of the wet seasons, the heavy stages and post-coaches scarcely moving, the horses straining with all their might to drag these ponderous vehicles, often down to their very axles in the mud, at the rate of three or four miles per hour.

Such being the condition of affairs, it would naturally be supposed that the mail would have been wholly transferred to the railways as soon as the latter began operations. But such was not the case. For several years the railways seem to have been no more expeditious or reliable than the post-riders, stages, and post-coaches. As late as the year 1835, or six years after the successful trial of the "Stourbridge Lion" at Honesdale, the postmaster-general threatened to remove the mails from several of the leading railways, unless they were forwarded with greater expedition and certainty.[2]

This threat to remand the mail contractors back to the stages may seem strange in view of the records made in the two famous prize contests of Great Britain and the United States. As early as October, 1829, in the great Rainhill competition, brought about by the Liverpool & Manchester Railway, Stephenson with the "Rocket" is said to have attained a speed of twenty-nine miles per hour.[3] This record was soon equaled in our own country. During the summer of 1831 there was a contest just outside of Baltimore for the prize offered by the Baltimore & Ohio Railroad. One of the contesting locomotives, "The York," built by Phineas

[2] 48th Cong., 2d Sess., *Senate Ex. Doc. No. 40*, pp. 22, 23.

[3] STRETTON, *The Development of the Locomotive*, pp. 30-32.

Davis, of York, Pa., after undergoing certain modifications, was found capable of running a short distance on a straight and level stretch of track at the rate of thirty miles per hour.[4]

Too much, however, can easily be inferred from these records. In all probability they are only estimates, and something must be allowed for the great enthusiasm that prevailed. But in any case they were extraordinary performances, and stand in no higher relation to what could then be done, day in and day out, than the wonderful bursts of speed of today stand in relation to the everyday performances of our engines.

The best locomotives now manufactured can attain and hold a speed for a short distance of certainly 90, and perhaps even 110, miles per hour, but the average running-speed of our fastest trains falls far short of even the lower of these figures. The running-speed of the fastest regular trains of the United States—and, it might be added, of the world—namely, those between Atlantic City and Camden, is 66.8 miles per hour. This run is, of course, only a dash, the distance by the longer route being but 59 miles, with no stops between the termini. The running-speed of the Empire State Express on its journey of 440 miles from New York to Buffalo, deducting 8 minutes for the four station stops it makes, is 54.2 miles per hour, while the running-speed of the North-Western and Burlington fast mail trains on their long journey of 490 miles from Chicago to Council Bluffs, allowing 35 minutes for thirteen station stops, is 51 miles per hour.

[4] *The Great Railway Celebrations of 1857*, p. 22.

It was not until the first railways had been in operation for several years that the locomotive fully established its superiority over the horse in point of speed and reliability. Shortly after the opening of the first section of the Baltimore & Ohio Railway to Ellicott's Mills, or in the summer of 1830, Peter Cooper, running the "Tom Thumb," a locomotive of his own construction, was distanced by a powerful gray horse drawing a car which by this victory became famous, and later played a conspicuous rôle in the public prints and early books on travel. Of course, Cooper's discomfiture was due to an accident, the slipping of the belt that operated the blower. This, however, only emphasizes my point, namely, that the locomotive could not yet be counted on for regular performances. In this contest Stockton and Stokes, the owners of the horse, undoubtedly did their best, for they were the great stage-owners of that day, and were determined not to let their mail contracts slip without a supreme effort to retain them.

That the average speed on the railways during the first decade of this form of transportation was little, if any, above that made by the post-riders and stages can readily be shown. Many of the contracts for the latter kind of service called for eight, nine, ten, and, we have seen, even as high as fifteen, miles per hour. The railroads scarcely did better. On March 28, 1835, the Post-Office Department complained that "the mail from New York to Philadelphia, by railroad, is usually late, taking more than thirteen hours from Jersey City. [And then added:] This was hardly the case in the worst of bad staging." [5] On April 30 of the same year,

[5] 48th Cong., 2d Sess., *Sen. Ex. Doc. No. 40*, p. 23.

in another letter of rebuke, the postmaster-general said:

> There have been two failures of the mail from beyond Philadelphia, at this city, in the course of the present week, occasioned, it is said, by accidents to the locomotive on the Amboy & Camden Railroad. These occurrences are peculiarly annoying at this time, and have become the subject of public notice and complaint. From the experiences we have had, the adaptation of the railroad to the purposes of mail transportation is becoming every day more and more questionable. It is very apparent that it cannot be relied on with that degree of certainty which is all-important in the transmission of the mail, and without which disappointments occur to the public, and complaints are rung in the ears of the Department from every quarter of the country.[6]

On November 24, 1837, it was ordered by the postmaster-general that one Hutchinson be offered $350 for the conveyance of the president's message, on the first Tuesday in December, by express mail from Washington to New York. This mail was to leave Washington at noon and reach New York at 4 a. m. the next day.[7] As the distance was about 230 miles, the average speed stipulated was a little less than 14½ miles per hour. On December 12, 1838, the postmaster-general approved the arrangement of the postmaster at Philadelphia for carrying the president's message by special mail on the railroad from Philadelphia to New York in five hours for $500.[8] In 1833 the mail was carried between these cities by the post-riders in six hours. As late as 1839 the mail trains on the South Carolina Railroad averaged less than 11 miles per hour in running from Charleston to Hamburg, a distance of 138 miles. It will be remembered that this was the second railroad opened in the United States de-

[6] *Ibid.*, p. 23. [7] *Ibid.*, p. 31. [8] *Ibid.*, pp. 31, 32.

signed for a general freight and passenger business, and that it began to use the locomotive as early as 1830. And it seems the postmaster-general feared the trains might have difficulty in making even 11 miles per hour, for the contract covering this route stipulated that "the way-mails are to be handed in and out, at the way stations, without stopping the cars entirely." [9]

While the examples cited show the railroads were but little superior to the post-riders and stages, they by no means present the railroad service at its worst. The railways I have selected were those first established, and connecting the principal cities, and therefore probably rendering the best service then to be found. Where the service extended over several railways it was even slower, for railway connections, unlike the stage connections, were very poor in those days. The running schedules of the different corporations seem to have been drawn up with the idea of making the breaks in travel as frequent and as long as possible. The traveler from Washington to New York, on arriving at Baltimore, would be likely to find that the train for Philadelphia had just departed, and on arriving at Philadelphia he would be likely to find that the train for New York had just departed.

There was still another reason why the railways did not at first make much better time than the stages. In the early days, and for many years after the railways were established, the movement of trains during the night hours was very limited, and on almost all railroads was wholly suspended. This placed the railroad at a great disadvantage, because the bulk of the mail—the morning papers did not then count for much—accu-

[9] *Ibid.*, p. 33.

mulated in the afternoon. The stages and post-coaches would start with it in the early evening, and where the distance was not great, as, for instance, between Baltimore and Washington, the mail would be at its destination about the time the train started the next morning. As late as October, 1841, some of the railways involved refused to adopt schedules urged by the postmaster-general which would have very materially expedited the mail between Boston and Charleston, because they called for night running, and would not yield, although the postmaster-general intimated Congress would indemnify them for the additional difficulties and expense incident to running in the night-time.[10] Shortly before this, one railway offered to carry the mail with night service at $300 per mile per year, and for $200 if the department would so arrange the schedules that the running would fall entirely between sunrise and sunset.[11]

The chief reasons have now been presented showing why the railways did not, and could not, at once offer a mail service greatly superior to that they found in existence. During the first decade, and even later, it was a contest between a slightly inferior, but well-organized, mode of conveyance, which was in complete possession of the field, and which, by long years of service, had become nicely adjusted to the work required, and a slightly superior medium of transportation, but unorganized, disjointed, with little flexibility, and as yet wholly unadjusted to the work expected of it.

As I have already stated, the inability of the railways to give a service materially better than the one

[10] *Ibid.*, p. 41. [11] *Ibid.*, p. 33.

already at the disposal of the Post-Office Department explains why the mail traffic was not more generally transferred to them than it was. In 1842 the mail was carried upon only 3,091 of the 4,026 miles of railway then in existence. In some few cases the mail was not transferred for other reasons than the inability of the railway to provide better service. The postmaster-general reported that several railways demanded greater compensation than he was willing to allow. But, broadly speaking, I believe it can be said that the abandonment of the stages and the more complete utilization of the railways was due to the fact that, when all things were considered, the railway service was not sufficiently superior to the established service to render a change desirable. The predictions of the wonderful speed with which persons and intelligence would soon travel, made when the first railways were opened, had not yet been realized.

But, notwithstanding the small progress that was made in the first decade of railway transportation, Horatio Allen was soon to be justified in making his decision, in 1829, in favor of the locomotive rather than the horse, as the motive power to be adopted by the South Carolina Railroad, then about to be opened. He took his stand, he said, "on the broad ground that in the future there was no reason to expect any material improvement in the breed of horses, while . . . . the man was not living who knew what the breed of locomotives was to place at command." [12] The stages and post-riders had nearly reached, if they had not already attained, the limit of their accomplishments. Fifteen

[12] *The American Railway*, p. 104.

miles an hour was too fast a life for even the toughest horse to endure it long.

Although wonderful progress in railway transportation was not made for many years, enough was accomplished, however, to justify abundantly the predictions made by Horatio Allen and his fellow-pioneers. The discovery and utilization of the electric telegraph; the substitution of T-rails for the light strap, bar, and edge rails that had been laid on many lines; the heavier locomotives this made possible; better bridges; closer connections; the amalgamation of short antagonistic bits. of railway into one harmonious line; and the more general operation of trains during the night hours—all these, and other factors not mentioned, so increased the effectiveness of the railways that the great stage lines fell out of the race. By 1850 a few railways for the accommodation of through mail and passengers ran trains at 25 miles per hour.[13] While this would not now be looked upon as rapid running, it represented a material improvement, and was fast enough to win the traffic for the railways. Not much progress seems to have been made during the next decade, at least not on the great eastern lines. In 1860 the postmaster-general reported that an experiment was made with a night mail between New York and Boston. This was one of the earliest attempts to unite several distinct companies, deriving their charters from as many different states, into one continuous line. The time between these two cities was reduced by this train to nine hours.[14] The distance being about 230 miles, the average speed maintained was but little more than 25 miles per hour. The

[13] 48th Cong., 2d Sess., *Sen. Ex. Doc. No. 40*, p. 50.

[14] *Ibid.*, p. 58.

service between New York and Washington was not so satisfactory as that between New York and Boston. Twenty miles per hour seems to have been all the department could secure from the railways forming this route.[15]

More than thirty years have now passed since the first railway was opened for business. The great stage lines, once powerful competitors for the mail traffic, have ceased to exist, except in the far West. And even here the great overland stages are soon to be crowded out by the Central and Union Pacific railways, now rapidly approaching each other. But, notwithstanding the fact that the stages have long since disappeared from the older portions of the country, stage-coach methods of handling the mail are still in vogue. To utilize the new form of transportation in anything like full measure, a new system of separation should have been introduced. But there was little deviation from the stage-coach ways. The railroads hauled the mail practically as the stages had hauled it before them. But a great departure was about to be made. The mails were soon to be distributed in railway cars instead of stationary post-offices along the route. The car was to become something more than a mere vehicle of transportation. It was to be the place in which almost all the work of sorting and pouching was to be done, and thus it was to become the backbone of a new system of handling the mail. Before taking up the introduction of the railway post-office, which is the technical name for a car devoted to the distribution of mail, the system the railway mail cars supplanted will be sketched in barest outline.

[15] *Ibid.*, p. 59.

The method of handling the mail in existence anterior to the introduction of the railway post-offices was built up about what were known as distributing post-offices. From the earliest days until the introduction of the railway post-offices the great problem which constantly vexed the post-office officials was the sorting and pouching of the mails. Before the mail can be started on its journey, it must be pouched. Now, obviously there cannot be so many pouches as there are places for which the mail is destined, because, among other reasons, the weight of the pouches would be so many times the weight of the mail that the means of transportation would be broken down. In many cases there would be a pouch for one letter. Under such a system the aggregate gross revenues of the Post-Office Department for many years would not suffice to pay for the pouches. That these statements are true becomes apparent on a moment's reflection on the final destination of the enormous number of pieces of mail sent out every day from the Chicago and New York post-offices.

In the very early days the problem of pouching the mail was not serious. The volume of mail was then surprisingly small. The mail generally went into one pouch. The stage drew up to the post-office, which was usually also the tavern, and the postmaster went through the pouch, and, after removing what belonged to him, added what mail he wished to dispatch. This could generally be completed before the horses were changed and the passengers had refreshed themselves, and there was thus no delay of the mail. Even at the time the railroads made their appearance there was no wide-

spread dissatisfaction with the way the mail was handled. The Post-Office Department, under its contracts, regulated the arrival and departure of the stages, and when necessary they could be held until the mail was ready, and thus the mail generally kept pace with the passengers. So long as the movement of the mail was equal to the most rapid transition of the traveler, there was no complaint from the public. There are instances on record, however, where the patience of the travelers was exhausted. By making up a purse sufficient to indemnify him for the fine the department imposed, they sometimes induced the driver to abandon the mail.

But long before 1830, the year of the opening of the Baltimore & Ohio Railroad, a single pouch ceased to hold all the mail on the heavy routes, and the simple methods that once obtained had given way to a more complicated system. As early as 1810 a law was passed authorizing the postmaster-general to establish distributing post-offices, and he accordingly designated thirty-five offices as distributing offices. So far as I can learn, these offices merely continued to do, but on a much larger scale, what they had already been doing for some time in a small way.

As the tide of emigration spread over the Mississippi valley, and the number of post-offices multiplied, distribution became more and more difficult. Direct pouching, from each office to every other office for which there was any mail, became more and more impossible, because of the number of pouches that would be required. To keep down the number of bags, the mail was now sent to the distributing post-offices from all the offices in the territory of which this office was the

center. Here the whole mass was sorted and pouched, and then shipped to the various distributing offices scattered about the country, each one of which now acted as a distributing center, and made up and forwarded the mail to the smaller offices grouped about it. To make all this a little clearer, let us suppose the system to be still in existence, and that Chicago and Boston are distributing post-offices. If such were the case, the postmasters in the smaller cities around Chicago would send any mail they might have for Boston and the smaller cities grouped about it to Chicago, where all the mail for Boston, and the territory of which it was the distributing center, would be put in one bag and sent to Boston, where the bag would be opened, the mail separated, and sent out to the surrounding offices. From this description of the work done in the distributing post-offices it is seen that the name "distributing post-office" was inadequate. It only described one of the two functions of the office. The initial massing of the mail was quite as important as the later distribution.

Although successful in keeping down the number of bags and pouches required in the transmission of the mail, the distributing post-offices soon became intolerable, because of the delays they imposed. In the stage-coach days, when the current of life moved slowly, they were in keeping with their surroundings; but in later times, after the railway communicated its quickened life to almost everything about it, the old order became unendurable. As I have before stated, so long as the mail kept pace with the passenger there was no complaint, but when the traveler starting from the same

place at the same moment almost invariably reached a common destination one or two days before a letter, the patrons of the post-office began to protest. In the illustration that was introduced a moment ago, the letter, on reaching Chicago, would be taken to the post-office, and in about ninety-nine times out of a hundred it would lose its eastern connection, and very frequently it would miss several connections; and when finally it did get to Boston it would again have to go to the distributing post-office. The traveler, on reaching Chicago, would in many cases at once board an east-bound train, and very shortly be on his way. To these long breaks in the journey of a letter the people objected. Finally their protests became so numerous, loud, and emphatic that the officials were forced to look about for a remedy.

At first the ax was laid at the root of the abuses that had grown up in and about the distributing post-offices. The emoluments derived by the postmasters at distributing offices consisted of a commission on the letters distributed. Originally the commission was 5 per cent. on letter postage, paid and unpaid. This was afterward increased by law to 7, and later to 12½, per cent. It was thus obviously the interest of the postmasters of these offices to increase their distributing business to the utmost; and, though expressly forbidden by the department to invite mail from its legitimate channel, this was nevertheless often done. Letters were frequently subjected to so many distributions that the postage paid on them was entirely eaten up. In some cases the commissions of the postmaster greatly exceeded the entire proceeds of his office, and a balance had to be

paid him from outside sources.[16] In 1851 and 1852 the postmaster-general made a strenuous effort to correct these evils and abuses. He framed new regulations designed to cut off unnecessary distribution, with its train of evils, and even went so far as to remove summarily several conspicuous postmasters for violating his instructions. The work begun by Postmaster-General Hall was carried on with vigor by Judge Campbell, who became postmaster-general in 1853. He caused copies of the distributing schemes used in the distributing offices, which were then about fifty in number, to be sent to Washington for examination. Mr. Henry A. Burr, the topographer of the department, to whom they were referred, found nearly all of them grossly defective and productive of unnecessary distribution, with its attendant delays and expense. By direction of the postmaster-general, Mr. Burr prepared new schemes, but in submitting them he expressed the opinion that, so long as the mails were stopped in transit for separation, no scheme of distribution could be devised which would give dispatch, or prevent passengers and express matter from outstripping the mail. The only effective remedy was the abrogation of the distributing post-offices and the transfer of the work of separation to "over the car wheels," as he expressed it. But the force of progress was yet too feeble to take this radical step. It was not long, however, before it was found that, although Mr. Burr's scheme corrected many evils, it was inadequate, long delays still being very frequent. In 1857 another step forward was taken. In this year the number of cities to which there

[16] *Ibid.*, p. 142.

was direct mailing was greatly enlarged, and on the trunk lines the mails were placed in charge of what were known as "express agents," who went with the mail and saw that the pouches were properly transferred at junction points. This practice very largely reduced the quantity of mail that had to percolate through the distributing post-offices, and, so far as it extended, prevented passengers and express matter from making better connections and thus outstripping the mail. Direct mailing having proved successful, it was so far extended by 1859 that thirteen of the fifty distributing offices were found unnecessary, and were accordingly abolished.

But even after these reforms were made, a very large portion of the mail moved in the old channels, with all the incidental delays. Only the mail between the favored cities was accelerated. The great object for which the Post-Office Department was now striving still remained unrealized, and the department hesitated to make the radical departure necessary to achieve it. The timidity and distrust of anything new which had so long characterized the department could not be shaken off in a day. But the first step had been taken, and the second had to follow. The department had placed before itself the ideal of giving the mail as great expedition as the most rapid transition of the traveler. This could only be secured by giving the mail at all junction points as close and perfect connections as the passenger could obtain for himself. This meant that on the arrival at Chicago of a mail train from St. Paul all the mail must be ready for immediate dispatch to the several railway stations to catch the outgoing trains, even though mail had been taken on but a few miles out

of Chicago. If a passenger could take an omnibus or cab and catch a train, the driver of the mail wagon must get the mail there. In such a scheme there was no place for a distributing post-office. The magnitude of the work that would have to be done in the cars, as well it might, caused the Post-Office Department to hold back. But a start was to be made very soon. A condition had arisen in the West, where neither railway nor post-office officials were so completely under the thraldom of old customs and regulations, which imperatively demanded a change. In July, 1861, the overland mails began to be carried over the Hannibal & St. Joseph Railroad,[17] this being the first railway to reach the Missouri river. The railroad being new, and the demands upon it being very heavy, on account of the war and the large influx of settlers, and its operation being difficult on account of the guerrilla warfare that existed, the trains were always late. St. Joseph being the most important distributing office in the West, an immense amount of mail arrived there every morning by the railway. The overland stages were scheduled to leave three hours after the train was due. All of this time was required for the distribution of the mail, so when the trains were late, the stages, which seem to have run with greater regularity than the trains, left with only a part or without any of the mail. An indefinite continuance of this state of affairs was not viewed with equanimity by Mr. William A. Davis, who had charge of the distribution of mail at St. Joseph. Despite the fact that he was a holdover from the *ancien régime,* having been forty years in the service, he still placed a very high value on promptness, and set about

[17] *Ibid.,* p. 81.

to find a way to overcome or offset the lateness of the trains. His remedy was to have the overland mail all ready for the stages when the train arrived. If this were done, the mail would not miss the stage, even though the train was full three hours late and the stage started promptly. To save this three hours he urged the postmaster at St. Joseph, and through him the officials at Washington, to be allowed to meet the mail on its arrival at the eastern terminus of the railroad at West Quincy and separate the mail as the train proceeded on its journey across the state of Missouri. His requests were granted, and he seems to have lost no time in putting his plans into execution. On August 5, 1862, he wrote the second assistant postmaster-general a brief account of his experiment. He said:

> One of the clerks and myself left here on Saturday, 26th, so as to be in Quincy on Monday, 28th ultimo, to commence the distribution of the overland mail on the Hannibal & Saint Joseph Railroad. Finding that the mail cars had not been arranged according to promise made . . . . instead of going to Quincy I proceeded to Hannibal, and succeeded in getting cars temporarily fixed, in which (though with some inconvenience) I think the work can be done until the new cars are ready. The distribution was commenced on Monday at Palmyra, and I assisted the clerk going up as far as Clarence, at which place I turned back with the clerk who had come down to go up on Tuesday; assisted up to the same point on Tuesday; turned back and distributed the mail going up on Wednesday myself. We have now got through with a week's service, and can confidently report that when the accommodations are finished that are promised by Mr. Hayward, superintendent of the road, the distribution can be done entirely to your satisfaction.[18]

[18] *Ibid.*, p. 143. Up to this time, although there had been some distribution of way-mail in cars, no attempt had been made to distribute through mail.

The promised cars were soon completed and put into service. From this humble beginning the service was soon extended, and, fortunately, during its formative period the railway mail service was in the hands of very able men. Limitations of time forbid stating who they were and what they did.

The next important advance in the railway mail service was made in 1875, and the credit for it belongs to Colonel George S. Bangs, who was then general superintendent. Mr. Bangs was a man of unusual energy, courage, and progressiveness, and to him more than to anyone else belongs the honor of thoroughly rousing the Post-Office Department to its great possibilities. His administration was epoch-making. It marked the end of the old and the beginning of the new order. Broadly speaking, before his time the department was a non-initiating body. Reforms were thrust upon it from without, and only adopted when inaction would no longer be tolerated. Since his administration the department has not only shown readiness to adopt improvements laid before it, but has also originated many.

Up to the time Mr. Bangs became general superintendent of the railway mail service the officials of the Post-Office Department aimed no higher than to secure for the mail as great expedition as passengers could obtain for themselves. Mr. Bangs was not content with this program. He hoped to obtain greater dispatch for the mail. The mail business had always been looked upon as an adjunct of the passenger business. Mr. Bangs hoped to secure exclusive mail trains, whose departure and arrival should be timed to suit the

wants of the Post-Office Department. In 1874 he presented his views to Postmaster-General Jewell, by whom they were favorably received, and he was authorized to open negotiations with the New York Central & Hudson River and the Lake Shore & Michigan Southern railroads for a fast mail service between New York and Chicago. For the account of the negotiation which follows, I am indebted to former Postmaster-General Thomas L. James:

> It was the old story of making bricks without straw. The Post-Office Department had no appropriation to pay for such facilities, hence it had to depend at first on the public spirit of the railroad authorities. Commodore Vanderbilt, the president of the companies whose lines were to be used, had had dealings with the Department, and was perhaps not altogether sanguine as to the practical issue of the experiment, or in respect to the countenance it would receive from Congress; but Mr. William H. Vanderbilt, the vice-president, lent a willing ear to Mr. Bangs's proposition, and did his utmost to aid him in putting it into effect. There being no special appropriation available for the purpose in hand . . . . Colonel Bangs stipulated that if Mr. Vanderbilt would have twenty cars built and the service performed, all matter originating at, or coming into, the New York post-office, which could reach its destination at the same time by this line, should be sent by this train, and that the railway companies could have the right to demand a weighing of the mail matter at will, all railroads being paid according to weight. When the details of the plan were communicated to Commodore Vanderbilt, he is reported to have said to his son, "If you want to do this, go ahead, but I know the Post-Office Department, and you will, too, within a year." Mr. Vanderbilt did go ahead! He constructed and equipped the finest mail train ever seen, ... ran it for ten months, never missed a connection at Chicago, and was always on time at New York. He did not have to wait a year, however, for a realization of the sagacious old Commodore's prophecy. Within three weeks, despite the indignant protest of Colonel Bangs, the mails of three states were ordered to be taken from this and given to another route. A grosser and more wanton breach of plighted faith it would be hard to find, and its results were far-reaching and disastrous.[19]

The Pennsylvania Railroad, not to be outdone by its rival, also established a fast mail service, and thus there was a double service between New York and Chicago, and the outlook was bright for even wider extensions of the fast mail service, when Congress, in spite of the efforts of the Post-Office Department, passed an act reducing by 10 per cent. the already inadequate compensation to the trunk lines for carrying the mail. Very shortly after this act was passed, the postmaster-general received a letter from Mr. W. H. Vanderbilt, which, after reciting the conditions and circumstances under which the fast mail was inaugurated, closed as follows: "Congress, by its recent action has expressed an unwillingness to provide suitable compensation for the service, and I am therefore obliged to notify you that the fast mail train between New York and Chicago will be discontinued on the roads I have the honor to represent, after Saturday, July 22, 1876."[20] Mr. Thomas A. Scott, on behalf of the Pennsylvania Railroad Co., sent in a similar communication on July 15.[21] The Post-Office Department being unable to offer any relief, the fast mail service, which began so auspiciously on September 16, 1875, came to an end on July 22, 1876.[22] Colonel Bangs was greatly disappointed at this abrupt undoing of all his labors, and worn out by never-ending

[19] *The American Railway*, pp. 318-20.

[20] 48th Cong., 2d Sess., *Sen. Ex. Doc. No. 40*, p. 184.

[21] *Ibid.*, p. 183.

[22] *Ibid.*, p. 103.

toil, and disheartened by the action of Congress, he tendered his resignation and insisted on its acceptance.

Though in operation less than ten months, the fast mail trains had been in existence long enough to establish themselves firmly in the esteem of the business world. They ran between New York and Chicago in twenty-six hours, making connections at all important junctions with trains to and from a vast territory, and thus advanced the mail by twelve, twenty-four, and even forty-eight hours for some sections of the country. The fast mail on the New York Central and the Lake Shore never missed a single connection, and was late at Chicago but three times, and at New York but once.[23]

As may easily be imagined, the discontinuance of this admirable service caused a great deal of dissatisfaction and unfavorable comment. In the following year an effort was made in Congress to restore the service, and an appropriation of $150,000 was secured on March 3, 1877. This money was to be paid for expedited service, and became known as "special facility pay." With this appropriation the department was enabled to restore the fast mail trains. In 1884 several more fast mail trains were secured in other parts of the country without the use of special funds, and since the latter year the service has been so widely extended that there is now scarcely an important mail route in the country that does not have at least one fast mail train leaving at the time and run at such speed as will best meet the needs of the Post-Office Department.

From a place in which there was no separation of the mail, the car has become the place in which nearly the

[23] *Ibid.*, p. 103. There is a slight error in the statement of Mr. James.

whole of the work of separation is performed. The mail is now sent from the stationary post-offices with the least possible separation. Broadly speaking, the mail is now distributed for trains rather than for cities. This allows the mails to be kept open at the central office until almost train time, and it greatly economizes both space and labor in the central office. The through mails, for the most part, do not even pass through the terminal post-office. Unless the interval between their arrival and departure is a very long one, they are transferred directly from one station to another. I have been informed by Mr. E. L. West, one of the division superintendents of the railway mail service, that not more than 5 per cent. of the mail passing through Chicago is taken to the central office, the other 95 per cent. being transferred directly from one train to another.

Although the mail is always received from the city post-offices undistributed, it is never sent to them from the railway post-offices in this condition, if this would involve any delay in the ultimate delivery of the mail. On the arrival in Chicago of the morning mail trains the letter mail for the business portion of the city is ready for the carriers, and the letters for the remainder of the city are sorted and are ready to go at once to their respective stations. The postmaster-general recently said: "It is the intention eventually to absorb all the work of city distribution into the Railway Mail Service whenever the mails can be expedited thereby."[24]

The ideal railway mail service of Colonel Bangs is now a reality. The mail on nearly every railroad in the

[24] Report of the Postmaster-General, 1895, p. 398.

United States is now the favored traffic. The mail goes on the fastest trains; the mail trains are given the right of way over all other trains; the mail is carried on any train the Post-Office Department may select; no mail is ever left behind, the railways always furnishing sufficient car space regardless of the suddenness of the demand that may be made; the mail cars are furnished with the best appliances that art and science afford; the mail cars are placed in the station where they can be conveniently approached; the railroads carry the mail between their stations and the post-offices; and finally, the railroad employees give the mail their first attention on arrival of trains.

RAILWAYS AS FACTORS IN INDUSTRIAL DEVELOPMENT.

LUIS JACKSON, INDUSTRIAL COMMISSIONER, CHICAGO, MILWAUKEE & ST. PAUL RAILWAY.

It will be necessary, in connection with the subject of this lecture, to remind ourselves that the year 1830 witnessed the first operation of railways, in the modern sense of the term, on a comprehensive scale for the carrying of passengers and freight.

In this year the Liverpool & Manchester Railway, thirty-one miles long, was opened in the Old World and the Baltimore & Ohio, from Baltimore to Ellicott's Mills, a distance of thirteen miles, was opened in the New. It may also be necessary to remember that about 10 years prior to this, namely, in the year 1819, the first steam vessel crossed the Atlantic; while in 1844 Professor Morse opened his telegraph line between Baltimore and Washington—the first practical telegraph system in the world. The steamship, the railway, and the telegraph are the gifts of the nineteenth century. They constitute elements new in the history of intercommunication.

The year 1830, and a few years before and after, therefore, mark an epoch in the career of the human race. From that year civilization in its accepted sense began to take its stupendous rise. I hold that that year marked the start of real civilization and all before it can be forgiven.

It may also be well to remember one other date, and

that is the year 1840. About this time manufacturing in the wider sense of the term began to take a place in the United States. It is very easy to trace the beginning of manufacturing in this country. It started, of course, in a very small way with the making of some of the immediate necessities, such as woolen goods. The iron-worker commenced to make a few plows. Some one of our forefathers, who had learned the tanning business in Europe, started to tan a few hides. The wheelwright went in partnership with the man who could make wagon bodies, and so it will readily be seen that a few woolen mills, plow factories, tanneries, and wagon factories had already made their appearance before 1830; but the bulk of the manufactured goods used in this country was sent over from Europe.

By the year 1835 over a thousand miles of railway were in operation in the country, and at the close of 1900, 200,000 miles, in round numbers, were being operated in the United States. From 1830 to 1901 is 71 years, so that this development of railways is practically within the span of life.

That the railways have been factors in industrial development is a self-evident proposition. It goes without saying that there must be development where there are transportation facilities. Railways can remain passive and freight will, nevertheless, come to them, and more or less development will take place; but railways can also take an active part in development, and it is the policy of most of them to do so. I can best illustrate passive railroading by the following incident: Some years ago a foreign government railroad official visited this country for the purpose of investigating traffic matters on American railways. He said that the time had arrived when the railroads of his country, as the American railways had already done, would have to take cognizance of commercial conditions. His particular mission was to perfect plans to meet the competition of a new route in an adjoining country. He was given information about tariffs, the system of interchanging freight-cars, and all that he inquired into. He became very much interested in the interest taken by American railways in development, and requested an outline in writing of what had been told him. He said that in the particular section of country in which he was interested the railway had been built as a means of communication, and the trains had been run back and forth day after day, with little active effort being made toward industrial development. If a man wanted, at his own expense, a side-track to a mine or to a manufacturing plant, months were taken up with red tape before giving a "yes" or "no" answer. About two years after his visit a statement was published in the official journal of the country, which practically amounted to an advertisement. It stated that if any capitalist contemplated starting a sawmill, the chief government forester, on application, would detail a deputy connected with the particular district to show what timber tracts in the Crown Forests were available.

It has been shown how factories such as the woolen mill and tannery sprang into existence, and it will have to be shown briefly how the railways gradually extended, in order to get a grasp of the subject as a whole.

At first the mileage of railways in this country was very small, and they were merely competitors with the teamster. And in passing I will say that railway rates, though affected by a multitude of factors, have their real foundation in the price of horse feed. The first railways in the country were ventures connecting one town in the East with another. It meant something to build railways in those days. The public had little or no confidence in them, but gradually the idea became popular and railways began to extend in several directions. The men who directed the affairs of the roads unquestionably foresaw development, but the first thing in hand was to understand the working of the new business and the securing of immediate traffic. Soon came the project of running the rails to a coal field in order to bring fuel to the large towns. Today this looks like a promising enterprise, but in judging of a past event one must see things as they appeared at the time in question. There was then an abundance of timber near all the larger towns, and cordwood was cheap. Nevertheless, the rails were laid to the coal mines, and still further extensions were made, so that by about 1850 the several lines of railway in operation between New York and Chicago formed an all-rail route. About 1856 lines were completed west to the Mississippi river. In 1867 the Missouri river at Omaha was reached, and in 1869 the railway was completed across the continent. But, though the railway spanned the continent, it must be remembered that between the Alleghenies and San Francisco there was, and is still, plenty of open space.

Building railways in Europe from one thickly settled district to another, with abundant capital awaiting investment, is one thing; building lines in a new country, extending them 50 miles beyond the last farm, and calling the terminus "End of Track," is another. One of the first things that the railways, and more especially those west of Chicago, had to do was to secure settlers on the lines. Hundreds of thousands of people now living in the great West are there because they or their fathers read the enticing pamphlets and leaflets published by the railway companies telling all about the new opportunities for farming. Great exertions were made throughout the eastern states to secure settlers for the West. Some railways even made efforts to secure farmers from the British Isles, Germany, and Scandinavia. The railways have now largely abandoned making efforts to secure settlers from Europe; in fact, the governments of Germany and Austria place obstacles in the way of disseminating emigration literature. But the western country is still sparsely populated, and the work of securing settlers from the more populous eastern states has to go on. On some railways a regular immigration bureau is established, with an official in charge, usually called the "General Immigration Agent," who co-operates with land companies, land agents, and communities requiring more settlers. Many an eastern man who was induced to come West by reading the railway companies' literature about government land, and who might have spent his life vegetating in the East, now owns a fine western farm, has become rich, and has lived to damn the railways that were the means of bringing him out. The growth of Chicago, the settlement and prosperity

of the western states, and the reflex of this western development on the prosperity of the East all attest the efficient labor performed by the railways in helping to get the country settled. The railways do all this from motives of self-interest, but where a great enterprise is well directed the commonwealth is benefited. Millions of acres still await settlement, and this work must go on. The fact that it was ever undertaken on so extensive a scale by the railways will in course of time be forgotten, but the result is permanent. All this is intended to emphasize the fact that, in order to secure a general development of industries, density of population is requisite. It does not mean that excessive density is required, but there must be a fair population. In this connection it may be noted in passing that history shows that anti-railroad legislation is generally identified with states that are sparsely populated.

Agriculture is of course the basis of the country's wealth. The territory west of Chicago is now recognized as one of the principal granaries of the world. This has been made possible only by the extension of the railways. A bushel of wheat is now carried by rail a distance of nearly two thousand miles for 27 cents. To haul this distance by wagon would cost $5.25 per bushel. The price of wheat in New York is today about 80 cents per bushel. In the early days of railroads, especially those west from Chicago, wheat and corn were the principal staples carried. If the harvest was good things went well; but if the farmers had a poor wheat or a poor corn crop it affected the railways severely. It affects them yet, but if there is diversified farming the farmer more easily recovers

from the effects of a bad year, and if the railway has diversified farming, mines, quarries, and factories on its lines it also gets over a bad year more easily. The railway managers, therefore, saw that they must not be entirely dependent on one crop, and took steps to bring about a change in conditions.

We have to understand that the railroads always did welcome factories that came to them. But in this new policy they did not wait to welcome them, but went after the business. The railroads said: "We must run our business just as every other manufacturer does—send out travelers to sell goods; advertise; tell what there is on the land; bring the water-powers into use; bring the coal into use; get brickyards to come." Then they thought: "What is the best thing to do?" The freight department might take it in hand, or the passenger department; but at last someone hit upon the idea that it would be better to put one man at the work, to organize it so as to bring about results. In other words, they were in the same condition as the manufacturer or business man is today. You know it is one thing to make goods and another to manufacture a market for them. That is the theory of modern business, and you will all have to remember it—you will use it in your own vocation, whatever it may be: to make goods, and to manufacture a market to sell them. We can illustrate it today: See all the American novels that are being sold. Now, the publishers do not wait until the critics say it is a good thing. They get right out and advertise; and they have immense sales, sales by the ton; they have themselves made the market. Mr. Carnegie is doing in the steel business the

same thing the publishers are doing with the novels. It is the way every business is being built up. It is called in the political economies, in very nice language, "to create a demand." "Manufacturing a market" is a little more slangy, but it carries farther.

I will illustrate how we are supposed to establish this department. The first thing was its organization. You take any railroad starting west from Chicago as it was some ten or fifteen years ago. At that time there was Chicago, and Chicago always had the soil and could grow; but beyond that toward the Mississippi there was very little development. The first thing was to take this territory in hand. My instructions were (just to show you how practically they did it): "Jackson, you jump on the train and look out of the window for about six months; study the country, and study our whole territory." I asked: "When do you expect results?" They replied: "In about three years." "All right," I said, "you have the right idea." Of course I did not merely look out of the window, but I commenced to pay attention to the business. The first thing was to get around to all these towns and get them to organize business-men's associations. There used to be in most towns a business-men's association. They generally had a billiard-room, and played a little whist, and such things, but I said: "Gentlemen, we have got to get right down to business, and do what your name says. You must form a committee among yourselves. One man must find out all about the mineral resources around your town, and one man must find about the timber, and you must post yourselves as to what you have. We want to get all this information collected. You know if you go anywhere from here to the Mississippi and pass the DesPlaines river, and ask the boy who lives there, "What river is this?" he will answer, "I don't know." It is somewhat better now, but at that time most of the people around their own towns in the country did not know. We had to tell them what their resources were in the first place. But at last we organized it. I do not know how many towns there are, but there are twelve hundred on the line I am with. We will suppose there are 5,000 or 6,000 towns on all these great railways, like the Northwestern, the St. Paul, the Burlington. You can go today to any of these towns and say to some of the business men, "I want to start a canned-lobster factory;" and they will say: "No; you cannot afford to bring the lobsters to the West to can them." But the next man says: "Mine is an excelsior factory." "All right; you are the man we want. We have cottonwood around here in plenty, and this is the place to locate your excelsior factory." As I said today, you can press the button and in most cases there is someone in every town who will tell you the resources, whether you can compete, and whether you can get a free site, and what you can do.

The first man I took out West, while working for another railway, happened to be an excelsior-factory man. In response to his inquiries at one town he was told: "Yes, sir; we could locate you here; but you go two blocks down the street and you will meet Mr. Brown. He is well posted on the locality." So we walked two blocks and found Mr. Brown: "That will be the very thing for this town; you go a little over

two blocks there to Mr. Wells." When we reached Mr. Wells, the manufacturer said: "This looks like another two-blocks man, Jackson. When is your next train out of this town?" We had to go out of the town because the men would not be bothered. But today men understand the value of an industry to the town, and endeavor to locate it. So the West we have, as it were, well organized.

Then we took good care, of course, to make our work known through the press. One of the first big notices was in the Sioux City *Journal.* They said it was something like the work of the minister of commerce of some country like France or Germany, and that we ought to have one here, and that the government ought to do for the whole country what this railroad was doing for the West; have the resources all listed, so that people could get information.

After we thoroughly organized the West, there was the advertising in the East. Everything we said was taken with 90 per cent. discount. The great center of manufacturing was around the Alleghenies. They had no idea that you could manufacture things in the West. But we had two or three leaders that we always would introduce. We said, for instance: "We can make steel rails in Chicago." That is a good argument, because it implies that coal and labor and iron and limestone and everything needed is there. We took care to use a few good leading arguments. The first thing we did was for years to advertise in the East just one plain statement—that the people were moving westward; that the lands in the West were being settled; that great markets were being formed

there, with great purchasing power; that the people were people of enterprise and would buy goods; that the eastern man should go West. We kept that up. One railroad kept that notice in its time-table, and issued forty thousand a month, with a copy of that argument, for eight years; and somebody must have read it. Of one circular alone four millions were circulated in the East. You can see the effect. All the agricultural-implement men were in Massillon and around there, except the two here, McCormick and Deering, and a few others. The people at Pittsburg had to sell their implements at a Chicago rate. So at last they began to say: "What is the use of being so far away from the market? The market is West; that is where they are growing wheat." So some of the agricultural-implement men commenced to move. They were about the first that commenced to go West.

The first thing we happened to see in looking out of the windows was that there is flax in the West. About three hundred thousand tons of flax straw were burned up. You know there was an idea that, because flax fiber is used for making linen, we could do what they do in Europe, and people tried to raise flax for paper pulp and linen. After a good many years we discovered that if you grow the flax for fiber you cannot grow it for seed, and our people in the West can only afford to grow it for seed at present. Sometime someone will discover how to utilize this western flax. I only mention this because it shows how, when a railroad takes hold of an industry, one thing leads to another. A man was experimenting in New York with this flax. He had made a great deal of money in the

South, and had a beautiful laboratory in New York. I wrote to him, "Why don't you come out West and see the place, or send a man." But every time it would not work; he would not come, and I had lots of correspondence with him. One day I telegraphed, "I am leaving on a tour through the flax country, and would be glad if you would send a representative." That seemed to do it. He wired me that they would come on the next train. We took them all around, and he started a plant up in Minnesota to make this paper. But after trying it for a year, in 1892, they could not make it go. He had spent $60,000, without success, and the World's Fair was coming on, so he turned the whole plant into a furniture-tow factory, and in 1893 they made $20,000 or $30,000 out of furniture tow, and they are making tow yet. That man came to me again a few years later, and said he had to abandon that flax business, but thought he could make mats from slough-grass. I took him all over the West to try to find that slough-grass, and he had his agents hunt for it, and I suppose they must have traveled a hundred thousand miles. They found it at a place near St. Paul and at one near Oshkosh, and at Oshkosh they have employed four hundred people for the last four years, and the same number at St. Paul, and they are opening another plant now in the North. So it shows how one thing leads to another. I saw the other day in the newspaper that the securities of the company have been listed on the New York Stock Exchange, so I presume it is a success.

Another time I happened to go into the office of a man who said: "Why don't you get some brickyards

on your road?" I said, "We have some." "None near Chicago. A man cannot do anything with these western roads, but with the roads that run into Chicago from the East. The western roads don't seem to have anything." "Well," I thought, "we must look into that." The main idea of a brickyard is this: that people will not build a brick house in the West, or they would not, unless the brick was within easy reach. Similar conditions prevailed in regard to sewer-pipe. At that time there were a few sewer-pipe factories at Akron, and nothing farther West, and by the time the pipe got to Chicago that was about all the freight it would stand. You can understand that there must be a limit to carrying cheap material. The people west of the Mississippi could hardly get sewer-pipe at all, except at great prices, because even the railroads could not make rates low enough on it. So as soon as brick was in the vicinity, when the old frame houses commenced to go, they commenced to build with brick, and build more substantially. At almost the same time a man on the South Side came in to us and said: "I want to make a sort of conduit-pipe. We must put the telephones underground, and I want to find out from you where we can get a deposit of suitable clay." "I do not think you can get it near Chicago, because that vitrified clay does not exist there; but we will try." So I wrote 127 agents within a hundred miles from Chicago: "Have you got anything in the shape of vitrified clay, or any good clay that will make brick? If you are too busy, please hand this to someone interested."

I do not want to bore you with these details, but I

will just illustrate how the whole thing is conducted, and how it grew from this. These agents got the letters. Eighty of them answered within a week—they had or had not. Some six answered in fourteen days, and about ten laggards answered in about three months. That happens when a man is dealing with large bodies of men. People say: "That man got ahead through pull," and so on. It isn't so; a good man does get along. But I am not going to sidetrack the audience on that question. Three of the agents answered by telegraph, "We have blue clay." I thought there was not much chance of it suiting, but that it was worth while to investigate these three cases. So I invited the manufacturer to come and look at the clay. I thought, "We might as well spread this thing," and I picked up the Chicago Directory and saw that there were 89 brick manufacturers in the town. I wrote them all a nice circular letter: "Blue clay has been discovered on the St. Paul road. We intend to run a special train next Wednesday at 10 o'clock; can you send a representative, or come yourself? If so, I will send a ticket." I did not want five thousand free riders; I wanted the brick men there. I received sixty-one answers; thirty-one acceptances, the others giving reasons why they could not come. Some argued that there was no use in putting brickyards out of Chicago. I notified the station agents to have those farmers dig holes to show the clay. I knew these farmers. I wrote them: "The train will arrive at 10:15 and will leave your station at 10:20, and if the hole is not dug we will pass on to the next station."

We came to these stations, and the first was very

good. At least I suspected it was good, because one man lifted the clay twenty times, and showed it to his man, and said: "It isn't much good; I don't suppose they will give us a good freight-rate here." I said to myself: "That fellow is kicking; he may buy the goods." The man who wanted the conduit-pipe said: "You can drop this survey; there is nothing to it; but you may be able to deal with these people." I had also three newspaper correspondents with me, and I thought, "We had better get some advertising of these clay resources, so that more people will come to know it." But that one old fellow I hung onto as I got onto the train. He said: "Oh, it's no good; besides, you wouldn't make a freight rate." I said: "Well, what sort of a yard would you put there?" "Ten cars capacity a day."

The end of it was, we got that man to put a yard there, and it is running yet. About a month afterward W. J. Alsip, a well-known brick man of Chicago who died the other day, said: "One of my competitors has gone up on your road. I think I will put up a plant there." You have no trouble to catch the second man. He sent a man up there for a week, and the man found a place just above this other yard, and they have put up a yard that has always given ten to twelve cars a day. These men shipped the brick to all the little towns around—Janesville, Rockford, etc.—and that has led again to other little developments. I don't know that I should take the time, but I want to tell you about that Alsip brickyard. After that man had started that brickyard, he treated the railroad very liberally. In every way I could see I was dealing with a man who

understood business. He said: "I want a side-track; but I don't ask you to build a railroad through my yard, but alongside, as far as you think it is proper. The rate now is three cents. You can charge me ten cents, if a competitor pays ten. But I don't want to pay any more than anybody else." He said: "I want you to live; I want you to make money. I don't want you to make a fortune." But he showed me that he was a liberal-minded man.

The next year the strike was on. That man came to me and said: "We are in a very bad strait, Mr. Jackson. I have started my large kiln, and the brick are burning, but I am short one hundred tons of coal; and if the fire goes out the brick are of no use, and we will be out thousands of dollars. I can't get a pound of coal in Chicago; the strike is on. I want your railroad to help me out with five cars." I said: "I don't know how we can get the cars, nor whether we can move them." But I went to the fuel agent and told him. He said: "I don't want anybody to know that we have coal, but I have about three or four hundred cars in the yards, anticipating a strike."

I went to the general manager and explained the case. He said: "He can have the coal, providing the fuel agent will give the coal." I said: "I have seen the fuel agent." (This also serves as an illustration: When we go to the general manager and see he is crowded with business, we must help him out.) "I have seen the fuel agent, and he will give the coal." He rang the bell: "John, go up and tell Mr. L. to give him the five cars of coal." Mr. Debs had given orders that nobody should move any trains out of Chicago, but

we managed it, and the next morning at 7 o'clock we ran them out with office help, and he saved his kiln, and was the only man in Chicago who had brick just after the strike. He completed a North Side contract, and got $9 a thousand.

The next thing we had to do was to get our timber known. Of course everybody knows that pine will sell, but there were a number of things, like hemlock, which about ten or fifteen years ago had no market in the West. This will illustrate how we developed the hemlock and the tanneries. The tanneries at that time were mostly in the East, though there had always been a few around Milwaukee. We could not get northern Wisconsin settled at all. The immigration agent said: "We cannot get any settlers, because we have no market for the timber they are clearing off." We went into that district and examined it, and took some woodsmen along with us, and made a report as to how much hemlock there was. We found there was enough hemlock there to run all the tanneries in the United States for fifty years, and we thought we would have to get the tanneries in the East to come West.

The next thing to do was to advertise it—to make it known. In Pennsylvania I heard the bark was going out, and would not last more than five or six years. That was fifteen years ago, and they have lots of bark yet. But on that idea I made this investigation, and had all the data about how much hemlock there was in Wisconsin. Then I got into the hotel at Warsaw, and thought: "Now, how can I make this known through the East? If I could get hold of the correspondent of the Milwaukee *Sentinel,* and get him to

put it as an independent report, it would be very good. So I thought I would go and find him. Then I saw him, sitting in the ink-bottle. I sat down and wrote:

"Special from Warsaw: There has been an investigation made of the hemlock," etc. I wrote the whole story: "Your correspondent saw Mr. So-and-So, and he reports so and so, and Mr. So-and-So, and he confirms so and so." And I want to say, it is good to be able to write a little article. That is to say, the essential part. If you have discovered how to make hard-boiled eggs, in that particular paragraph where you say, "Take three paving stones, mix them with turpentine, and the result is hard-boiled eggs," you want to be able to write that part yourself; you can rely on the reporter to put in the parsley and the other things that are served with eggs.

I got this article written, and mailed it to the paper, with compliments. The man at the other end was a smart fellow. He was working for the newspaper, as I was working for the railroad, but he saw that if we could get these tanners from Pennsylvania into Wisconsin they would sell more newspapers and get more advertising. So he takes this article and puts in big scare-head lines: "Wisconsin the Coming Place for Tanneries! Pennsylvania Tan-Bark Going Out!" Then my report.

When I came to Chicago and took up the *Evening Post,* there was an editorial about Wisconsin going to be the tan-bark country. I said: "They must have published that article of mine." I got a copy of the *Sentinel.* They had it all in, and some fellow in Milwaukee was correspondent for a Philadelphia paper,

and he thought he could make five or ten dollars, so he telegraphed that through the Press Association, and it went all over Pennsylvania. A week afterward I received a letter from a friend of mine, and he said: "The St. Paul road seems to be making a great spread of its tan-bark." "Yes, you idiot," I said; "but why didn't you send me a copy of the paper?" A man wants to see how far the children of his brain have traveled, and what they looked like when they got into the East. Don't tell a man, "I see by the paper," but "I send you the article."

However, I wanted to know whether it was necessary to advertise any more about that. But in a few days I got a letter from a big Philadelphia tanner, inclosing a copy of the article from the Philadelphia *Ledger.* The long and short of it was that the first man came from Boston and thought he would look at the bark. He had two cars of bark shipped east, sampled it, said it was all right, came back and established a big tannery at Merrill.

I was looking over a copy of the circular which we afterward printed, with that extract from the newspaper. That circular says: "The bark on this line commences at Warsaw, goes to Merrill, and thence to Tomahawk." To end this story, today we have the United States Leather Co., with their tannery at Warsaw, the American Hide & Leather Co. at Merrill, and the Eastern & Western Tanning Co. at Tomahawk. So the three places are taken up with tanneries. A few years after this circular had gone out, the Wisconsin Central put on a commissioner, and he has done twice as much, I suppose, as the St. Paul road.

A few years later a man started a paper-mill—but I will cut that story short. In 1891 we had the first paper-mill on the Wisconsin River. Today there are nine paper-mills there. Another man tried an experiment, and thought he would make paper with hemlock. I said: "We have just located a big tannery up there." "That is the very thing for me; the tannery will take the bark and I will take the logs." And that has been done since then. He went up and took the logs that the farmers had peeled.

I think by this time you have a general idea of how this applies to almost every raw material, and how we start the development. Then, too, we had to establish good hotels at these towns. For instance, if you go to a man in the East and say, "If you come west, and want to locate a factory, I will take you to Canaryville"—if he cannot get a decent bed there, and cannot get anything to eat, he will probably not locate in Canaryville. One of the things we had to do was to encourage good hotels through the West. In Wisconsin and all of this western country now they are fairly good. The Waldorf-Astoria, in New York, cost, furnished complete, many million dollars. I recognize it as a public-spirited undertaking which reflects credit on the owners and the citizens. If you cannot entertain people at your house, if you are living in a small town, at least see that there is a good hotel there. For instance, at Marinette you could not keep a man twenty-four hours; no eastern man would stay. I called the business men together, and talked to them, and they said: "We will subscribe $75,000 to a hotel. If we make 6 per cent., all right; if we make 5 per

cent., or 4 per cent., all right; but we will have the hotel"—and they built it. [At this point the speaker was interrupted by the ringing of the bell which announces the close of the hour.] But there is the engine-bell. "Chicago, all out!"

SOME RAILWAY PROBLEMS.

PAUL MORTON, SECOND VICE-PRESIDENT, ATCHISON, TOPEKA & SANTA FÉ RAILWAY SYSTEM.

Next to agriculture, the transportation business of this country is first in importance. Production first, distribution second. It has been estimated that over one-fifth of the wealth of the United States is invested in railroads. They employ directly over 1,000,000 men, and for wages alone pay out nearly $600,000,000 annually, while the total annual disbursements of the railroads of the United States amount to nearly twice as much; and yet seventy years ago the locomotive was unknown, and nowhere in the world did a railroad exist.

In 1832 there were only 229 miles of railroad in the United States, while today there are over 200,000 miles of track. It is said a man will carry 66 pounds twelve miles per day over bad roads; a horse will carry 440 pounds; a locomotive will haul 350,000 pounds a greater distance in an hour at a cost of, say, half one cent per ton per mile. You can readily see the strides made in transportation, and you can almost measure the progress of civilization by it.

It is in the country in which we live that railroading has made its greatest strides, and we should all be proud of the fact that, notwithstanding we have only about one-twelfth of the population of the world, we own and operate fully one-half of all the railway mileage of the globe.

It is with considerable satisfaction that we should ponder on the advantages to this country of having the cheapest rates, both freight and passenger, that exist anywhere in the world. You can ship freight and personally travel farther for less money, receive better service, and enjoy more comfort than the people of any other section of the earth. This is one of the dominant causes of our success commercially, and it is well to keep it prominently in mind.

The average rate of freight charged in the United States in 1870—about thirty years ago—was nearly three times as much as is charged today, or, conversely, the average rate per ton per mile now in existence is only a trifle over one-third of what was paid in 1870. American railroad rates generally are more than one-third lower than those in Great Britain.

In my opinion, railroad rates should be unfluctuating, and without preference as between individuals and communities. From the beginning of railroads until about 1870 there were very few laws, either state or national, for their regulation. About 1872 an agitation commenced which has generally been referred to as "the Granger movement," and all kinds of railroad legislation was then advocated. There seems to have been a delirium for regulation of passenger and freight rates by statute epidemic at that time. The first national law, however, that was considered, was known as the Reagan bill, and from this sprung the present law known as the Interstate Commerce Law, which was designed to prevent unjust discriminations in rates; but in the discussion of that measure the feeling against trusts and combinations of all kinds was introduced,

and pooling was prohibited, which has resulted in a continuation of preferential rates—mostly of a secret nature—all of which are a menace to justice and fair play, and ought to be obliterated. At the time of the discussion of the merits of the Reagan bill, Judge Reagan, the originator and introducer of the bill, was against pooling, but after having been chairman of the Texas Railroad Commissioners for over ten years, he has changed his mind and now favors such legalized pooling.

The competition between our large carriers is so intensely energetic that it seems impossible to secure a maintenance of rates without an apportionment of the business. The longer the line and the poorer its service between any two competitive points, the more inducements it is tempted or obliged to offer to get a share of the traffic; and the more business it is allowed by the stronger or shorter lines to take, the greater the share it is educated in believing itself entitled to; so that it becomes an absolute necessity for the strong lines to recognize the competition of the weaker ones. Large shippers thoroughly appreciate this and are quick to take advantage of it. It is quite remarkable, under existing conditions, that rates have been as well maintained as they have been. The old saying that "competition is the life of trade" does not seem to hold good in the present age. Carried to its logical conclusion, unrestricted competition is the death of trade. It is well to be reasonable in all things, and while I favor competition in service and think it should continue, I am opposed to any condition that reduces rates below cost and a fair margin of profit, or advances them to a basis that may properly be called extortion.

There have already been tremendous strides made in combining railways. The Atchison, Topeka & Santa Fé Railway system is composed of over one hundred smaller corporations. Rates are now lower, service is better, and wages are higher than before the consolidations took place. The people expect more from large corporations than from small ones, and they are usually managed more intelligently and are more apt to respond to public opinion. The very fact that they represent so much capital makes them quite anxious to maintain the good-will of the community.

The best-disciplined and experienced commercial minds of the world are now engaged in trying to work out in all industrial pursuits a plan whereby, through combination, unrestricted competition will cease, labor and capital be protected, and the world generally be more intelligently and better provided for.

One of three things in the railroad business is sure to happen:

1. The legalization of pooling, whereby the railroads may make enforceable contracts between themselves for a division of the business based on reasonable rates.

2. The unification of ownership, which, in the absence of the first proposition, is making rapid strides.

3. The taking over of the railroads by the government, to own and operate them as is done in Germany and some other European countries.

I have always been an advocate of legalized pooling, because I believe it will go a long way toward insuring a maintenance of tariffs, and thereby prevent favoritism and inside rates to large shippers and great cities. I

believe that the very foundation of the state itself is threatened by any long-continued discrimination against the small shipper and the small town. We want prosperous villages and towns all over the United States, and in time we will insist that the freight rates of the country shall be as unfluctuating between individuals and communities as the price of postage stamps.

How long would Chicago stand up as an importing center if the customs favored New York merchants with a lower tariff? The importers here would have to buy their foreign goods through New York agents, and yet the question of custom-house duties is a very insignificant one as compared to the transportation charges in a country like ours.

I can see no good reason why Congress should not legalize pooling, so long as rates are reasonable. Rates can become unreasonable, and there is as much to fear from their being unreasonably low as from being unreasonably high. They can be so low as to be unremunerative, thereby in time impairing the property and destroying the service. They can be so high as to check the movement of business. The selfish interest of the carrier generally prevents this. There should be proper supervision to see that they are reasonable, which means neither too high nor too low for increasing and promoting commerce.

The absence of an arrangement similar to pooling is causing the unification of ownership of our railroads. This is now frequently referred to as "the community of interests." Personally, I prefer it to pooling and do not view the ownership of all the American railroads by a single company or interest with the slightest

alarm. The benefits the public would receive from such a condition would be much greater than any harm that could come from it. Unrestricted competition benefits a few, is disastrous to the many, and costs too much. There is a vast amount of money wasted every day by American railroads, which ought to be saved; and if it could be saved, the railroads of the country would certainly give the shipping and traveling public a fair proportion of it, either in lower rates or an improved service.

It has probably never occurred to you that ever since railroads have been used rates have been getting lower and the service getting better. Fifty years ago the large proportion of the travel was by stage at twenty-five cents per mile, no baggage was allowed except that which you carried in your hand, you rode three in a seat with the greatest discomfort, and made forty miles a day if roads were good. Now you can travel with the greatest of luxury, with Pullman cars and dining-cars, for about 2½ cents per mile, and make forty miles in an hour. In other words, the transportation of the country has advanced in speed from forty miles per day to forty miles per hour. And the comforts coined by American inventors and transportation men are easily more than sixteen to one in the circulation of commodities and persons with certainty, celerity, and safety throughout this vast republic.

When all the railroads are owned by one syndicate —it looks to me as if the syndicate would be composed of the people generally—there will arrive a time when a vehement demand will be made for government ownership and operation of the railroads of the United States.

It will be phenomenally remarkable if such demand does not come. But I doubt if such popular importunity will result in the transfer of the railroads from individuals to the government, because it is manifestly demonstrable that private parties can more efficiently and cheaply operate the roads than can the government.

There are many things against the ownership and control of railroads by the government. The building up of such a great political power would be a sufficient reason for opposing such an ownership and management, but the simple fact that the government seems unable to do anything efficiently and economically in the way of building or operating properties is a far better reason for confining our government to legitimate functions and keeping it out of all business, except its logical one of protecting the life, liberty, and property of its citizens.

The problems that a railroad traffic officer has daily to solve are so diversified and interesting that they are always fascinating. His everyday life is made up of all kinds of surprises. He has two groups of citizens always in view, one being his employers—the stockholders of the company he serves—and the other being his constituency, or the public which the railroad serves and to which he is obliged to cater. He probably finds, from a perusal of his morning mail, that there has been a smash in copper or a labor strike which may close up some mining district or shut down some industry; or that a bad frost has destroyed the fruit crop; or that hot winds have burned up the corn; or that a war declared between two foreign countries has caused a great demand for transport service, thereby taking out of regular channels such a large number of ships that ocean freights are all out of joint. All of these things may make it necessary to readjust rates in order to keep things moving. The traffic official who serves his constituency best, and thus promotes the prosperity of the people whom his company serves, serves best the company which employs him.

I believe in the Interstate Commerce Commission, or some similar body of men appointed by the federal government with power to supervise rates where there are pooling contracts in existence, and believe that the law should be more comprehensive than it is now.

I believe that all transportation by rail and water should be declared interstate commerce and subject to the supervision of such a commission. I do not think there is sufficient state traffic by itself anywhere to justify excluding it, and I dislike to see certain states taking action to protect the people within their own borders by nullifying orders that have been issued in the interest of the country generally by the national Interstate Commerce Commission. If we are to have a strong federal commission, it is best to give it, if possible, full power over all traffic, both state and interstate.

I am in favor of the English custom which makes it necessary to develop reasons for a railroad before it is allowed to be built. Railroads which are built for the sole purpose of selling out to lines already existing should not be tolerated. I think this is a matter that should be passed upon by the national commission, and that no railroad should be chartered unless a necessity for it is clearly shown. Duplication and paralleling of railroads is a waste of money. The public finally has to bear the burden of all unnecessary railroads. A rail-

road may be likened to a street in a large city: it costs money to build a street and to keep it in order, and the citizens have to pay for it. Therefore, unnecessary streets, as a rule, are not constructed, and, in view of the control and regulation already partially assumed by the state and national governments, I think that a similar protection to railroad investors and to the people themselves may be, and ought to be, demanded and accorded.

To conclude, I desire to say to you that the railroad business is a very fascinating occupation, and that it affords to young men as good a field of labor as any other avocation. It is not regarded as a profession, although without doubt it is just as much of a profession as either law or medicine, and within its boundaries are just as many opportunities for specialists as in either of the professions mentioned.

There is now, and always will be, a great demand for capable men, of good judgment; and it seems to me that every branch of the railroad business affords great opportunity to young men. My advice to the young man who wants to acquire a knowledge of railroading is to start on as small a road as possible, where he can get a knowledge of all departments. After acquiring more or less knowledge of the workings of the several departments, it will be easy for him to decide which particular department he prefers. Of course, a young man cannot always decide this matter for himself, and under such circumstances he should endeavor to master any work that is given him, with the well-defined idea that good men are scarce, and that there is always room at the top, which can only be reached by intelligence, industry, and integrity.

RAILWAY CONSOLIDATION.

E. D. KENNA, VICE-PRESIDENT, ATCHISON, TOPEKA & SANTA FÉ RAILWAY SYSTEM.

This appeal to the laity by your faculty has been made, I take it, in the hope that we may place before you the problems confronting us, the facts out of which they arise, and the remedies suggested.

Today we are to consider the consolidation of railways; but, in studying any part of the railroad question, I warn you against confounding it with the trust problem. They are not correlated, and each must be viewed by the student from entirely different standpoints. Property controlled by a trust is private property, and its business, private business. Any man with sufficient money and brains—and the former will command the latter—may become a trust. But, what is more important, as indicating the distinction, he can cease to do business when he so chooses. On the contrary, a railroad must remain for the use of the public, even though the same cannot be operated except at a loss. Furthermore, the carrier must sell its commodity, which is transportation, to all customers on equal terms, which the public may fix, if it desires to do so. The difference between a trust and a railroad company, in the respect I have mentioned, is practically the same as the difference between the business of a manufacturer largely controlling the making of letter paper and the Post-Office Department of the government.

While today's topic presents, apparently, but one

aspect of the railroad problem, yet the subject involves so many of its phases that we must review it in its entirety, if we are to consider it fairly. Fully to understand the subject, it is necessary to state that the policy advocated in the way of combinations and consolidations will do away entirely with competition between carriers. As this is a course which has long been opposed by the American people, those who favor it realize that the difficulty of making their case before the bar of public opinion rests with the advocates of such policy. Many of its advocates are railway men, and, while their statements may not convince you of the correctness of the conclusions founded on them, yet the deliberate and honest opinions of men who have faced for years the hard and intricate problems of railroading are certainly worth all that is asked for them—a fair and unprejudiced hearing. And, I assure you, as one knowing them well, that these men appreciate your judgments, based on their experiences, for they realize that a student may often extract a truth in the laboratory that lies hidden in the forge. You will do them a service to expose the fallacies of their beliefs—if they do not convert you. I do not believe these men have seen all the light on the subject, nor do they. Nor do I believe that anyone has yet offered a solution of the problem. That is too much to be expected at this, the infant stage of the greatest business of the times; a business that has drawn together the people of the nation as no ordinance could have done, and which may yet change the map of the world.

"Combinations," "pools," "consolidations," are all misleading terms, and narrow the question. They deal

with specific remedies, or offenses, according to our point of view. The broad question presented is whether competition between carriers is to be favored or opposed.

The original idea was that railroads were to be, as canals had been, highways that anyone might use, on the payment of tolls, each patron furnishing his own equipment. And at that time this arrangement accorded exactly with the understanding of the general nature of a railway. It was rightly considered to be a highway, which all might use on terms of exact equality; differing in no principle of relationship to the public from a canal, a road, or a street. Thus, in the beginning, all seemed satisfactory. Private capital furnished the money, and only those directly benefited by the use of the railway were to be required to pay, and they might use all its facilities on terms of precise equality. It was not apprehended that there would be obstacles in the way of a man bringing his own engines and cars, and engaging in the business of carrying, which was, of course, considered a private business. Our forefathers did not realize that it would not be as easy to run one's own train on a railroad as it had been to navigate one's own boat on a canal. When it was found impracticable to have every traveler transport himself, and the exclusive right to operate was given a corporation, its officers forgot that the railways remained public highways, and the people forgot that they had created monopolies and contracted to afford them certain protection. The people had expected that the railways would open up inland ways, and would be to domestic commerce what the ocean was to foreign

trade. They expected that there would be competition on such railways, engaged in by private carriers, just as there was, and still is, on the ocean. Note this well; for such a proposition is at utter variance with our present views, that wheat shall be carried from the field to the seaboard at the same price for every shipper, but from such point to the world's markets each shipper shall be free to get any advantage he can.

The first charters were specially granted by state legislatures, three only having been granted by Congress, and these to aid the construction of the Pacific railroads. With such national needs fully met, Congress ceased to grant railway charters, its latest being dated 1866. But it was soon found that railway construction was being held back because legislatures only met, as a rule, biennially; and it was concluded that time was wasted in requiring the promoters of such projects to remain inactive during such intervals; and therefore general laws were passed which allow any persons, generally required by statute to be not less than five in number, to build to and from any point that may be designated in the "Articles of Association." They pay nothing for the franchise they get, save a nominal filing fee. In no state is the incorporation tax large, and until quite recently one could get a charter to build from Chicago to the Pacific coast for less than $100. It would probably cost now $1 for each $1,000 of capital fixed. And why should these charters cost anything? They have no special value. Anybody can get them. A railway charter, it is true, carries with it a monopoly of doing the carrying business on that railway; but, as there is no monopoly of territory or

location granted, it is no more valuable than would be a street-car franchise, if one could get an ordinance to build on any street, and the streets were so broad that an indefinite number of lines could be built thereon. I do not question that, on the whole, the policy of attaching no value to a railroad franchise has been more useful than harmful. If railroads have been encouraged thereby that ought not to have been built, it is also true that railroads have been built that were needed, and which otherwise might have been prevented. But many of the present difficulties arise from the utter lack of restraint on unwise and reckless railroad construction; and greater ones are yet to be encountered if such policy is persisted in.

It was early seen that a single corporation owning a line from New York to Buffalo was preferable to many small corporations each owning a part of the line. The line of the New York Central between the Hudson and Lake Erie represents the union of what was originally sixteen different companies. It soon became the general policy of all states to authorize corporations owning continuous lines that could be connected physically to enter into arrangements whereby such lines might be operated as a single railway. This resulted in the disappearance of many small companies, and the constant absorption of branch lines as they were built. So great are the economical advantages and the convenience of such arrangements that the present policy is, not only to foster like combinations, but to compel the maintenance of through lines, divisions of rates, and exchange of cars. It is interesting to note that when the consolidation of connecting and continu-

ous lines was first suggested many people were as furious in their assaults on the laws that authorized such consolidations, and as emphatic in their declarations of the dangers that lurked beneath the same, as are the opponents today of consolidation by competing carriers. I do not mean to draw a parallel, but merely to suggest that the fears of our citizens are easily excited.

In using the term "consolidation" today, I shall wholly disregard the legal definition of that term, which means the process by which, under authority of law, two or more corporations are merged into one; and shall treat as a combination or consolidation every arrangement that permits one management to replace two or more previously independent. And I shall assume that nearly everyone admits now that a continuous line, with connecting branches, is preferable to many disconnected lines, operated by many corporations. In other words, I shall assume that we have been progressing in the character of service furnished the public, however slow our advance may have been in solving the problem, and therefore pass on to the question of how the problem is affected by what is proposed under any form of combination or association, agreement, or consolidation, whereby competition between carriers may be restrained or removed.

What is the railroad problem? As was said years ago: "The troubles that are always present, always annoying, and always difficult of adjustment are those which relate to the making of rate-sheets, and to the manner in which these are observed or treated after they are made." But such a definition of the problem is

faulty, in that it disregards both the public's interest and the owners' in relieving carriers from all unnecessary restraints. I think there is no longer any misunderstanding between fair-minded men as to what are the rights of the parties, respectively. The people demand, and are entitled to, reasonable rates, and they ask to be, and should be, secured against unjust discriminations affecting either persons or places. The owners expect, and are entitled to receive, a reasonable profit on their investment and some compensation for their risk.

I think we will all concede now that this problem cannot be met without legislation. I am one of those who long entertained a contrary view. But when it was judicially determined that the business of a carrier, originally considered private, should be regarded as of a public character in its most important aspect, and held that its cars and engines, and even carts and horses if used to perform a terminal service, are affected by a public use, then it seemed to me to become the duty of everyone to recognize that the state, which can only give its directions through laws, should be aided by its citizens in formulating such laws.

And now let us view what the public has done in the way of regulating, or rather attempting to regulate, the railway companies. The right to regulate was not expressly reserved in any of the early charters, and it was contended, with reason, that no such reservation had been made. Few roads would have been built with private capital had it been known that the time would come when the people would assert the right, not only to make rates, but to say that, while the investor risked

losing his whole investment, he would never be allowed to make over 6 per cent. But with our prairies a waste and our forests impenetrable, with the riches of the Rockies lying useless and the most wonderful valley yet a frontier, it was not the time for the people to startle capital with the warning: "You risk your whole venture, and, when it is made, we reserve the right to say how much you may gain." Yet that was the time when the people should have been outspoken. That they were not is a charge of which they must always stand convicted.

But if the people erred in the first instance, the railroads soon evened matters. The people had been more than generous. The railroads were less than just. Their claims, if not unreasonable, seemed intolerable. All companies asserted the right to make any rate and practice any discrimination. They even resisted attempts at regulation in matters concerning public safety. But nothing is so dangerous, nothing so brief, as absolute immunity from any control; and the calamitous contest of the early seventies we all know—some of us from history, some of us from actual contact. The people lost all sense of justice and became wholly indifferent to all rules of fair play. "Hang the railroads, and try them afterward," a legislator was heard to say publicly. The first battle was short. The contention of the people in support of a legislative right to control carriers was sustained by the courts. Then began the long struggle. Under such power, confiscation was attempted, and men wondered for a time if rights of property were to remain inviolable. Happily, the threatened wrong was prevented by the wise limi-

tations of our constitution. I believe it substantially a correct statement that, at one time or another, the people have tried by experimental legislation every suggested solution of the problem except two: government ownership, and authorized agreements to maintain rates.

The result of trying everything has been what might have been expected of such a course: a set of laws lacking system, irreconcilably inconsistent, and utterly impracticable.

I take it you are all familiar with the Act to Regulate Commerce, by which Congress created the Interstate Commerce Commission, and which provides that rates shall be reasonable and just; that unjust discrimination shall be punished; that rates open to all shall be published ten days in advance of any changes therein; that a greater rate shall not be charged for the shorter haul than for the longer one, the former being included within the latter, and in the same direction; and that pooling shall be unlawful. Most of the states have similar laws, and many authorize their commissions to fix rates also. With this single exception, the powers of the national and state commissions have been substantially the same for years. The student will observe that the public now concluded that unrestrained competition between carriers was undesirable, and that passenger fares and freight charges should be—like postal rates—reasonable, uniform, and stable; and that the railways, in their capacity as carriers as well as owners of public highways, should be treated as public servants, and regulated accordingly. For it was easily seen that, if a shipper was permitted to secure a

lower rate than his business rival, the government would be placed in the attitude of allowing, through its policy and laws, one citizen to secure unjust advantages over another. And so it was declared that there should be one rate for all, and it a published rate, that should not be changed without timely notice. The people rightly declared that rates should be reasonable and that unfair practices must cease, but they acted irrationally when they tied the hands of a useful servant. It is unwise to shackle even a slave. The responsibility for the Act to Regulate Commerce rests with the people. Every railroad man in America said that in its present form it would be a failure. Most students of the problem thought so. They did not hesitate to say why, nor to give their opinions under oath. Aside from the long- and short-haul clause—a hurtful provision, if intended to mean what some contended it did mean; a useless one, as it stands under the decisions—the one great point of difference was whether pooling should be authorized. Out of one hundred and forty-nine persons who testified before the Senate committee, which reported the Commerce Law, and of whom only twenty were railroad men, ninety-four favored pooling. A majority of men thoughtful on the subject had reached the conclusion that, if a railroad was to be regulated as an arm of the public service, then uniformity of rates was the first consideration, and stability of rates the second. Competition means varying rates, seldom the same today as yesterday, and more rarely the same to all patrons. When we say competition is the life of trade, we mean that the bidding for business which is accompanied by constant reductions, secret prices, discounts, and premiums is a good thing for the buyer. We mean that we want to be privileged to buy the same article on the same day at a lower price than our neighbor. And we are willing that he should drive a better bargain than we are able to secure. But when we apply, in a vapid way, the same principle to a company furnishing a public utility that all men use, we mean nothing of the kind, which is another way of saying we don't know just what we do mean. The advocates of pooling foresaw that, as a carrier can take no business away from a competitor by an open rate, of which due notice is given such competitor, the only way to get business by reducing the rate would be to give it secretly. But the people were biased against pooling —I use such term as including all agreements to divide business—as a means of maintaining rates. If there is anything more blind than prejudice, I know not what it is. If there is anything worse than being blind, it is being blind and trying to walk alone. In this case, unfortunately, the public would have no leader, and it staggered along as best it could, and refused the assistance offered to prevent these depredations of modern days that are as hurtful to honest trade as piracy was of old. Such men as Judge Cooley, whose ordinarily judicial temperament would, at the mention of a trust, give way to the fervor of a public prosecutor, said, in words of warning:

> Experience has shown that this idea of railroad competition is a mistaken one; that it cannot be compared with competition in channels of commerce in general; . . . . it is utterly impossible to judge of railroad competition and its effects, its usefulness and its mischiefs, by comparing it with competition as we encounter it in other lines of business.

Again he said:

> There is a demand for legislation that will secure at the same time steadiness of rates and unrestrained, and even active, competition, things which necessarily kill each other.

How clearly he foresaw we know now, for they have killed each other. There is neither stability of rates nor honest competition. The opponents of pooling triumphed. For the evil consequences I refer you to the most recent report of the Commerce Commission.

It may be said the Commerce Commission has not been given the power to fix rates. That is true. But nearly every state commission has, and if such power was the corrective claimed for it by its advocates they should be able to cite at least one instance where it has been successful, among the many where it has been tried. The commission has said the great, and so far irremediable, evil is unjust discrimination. That this class of offenses cannot be prevented by giving to commissioners the power to fix rates, everyone should know, for all business within such states is subject to the jurisdiction of state laws, as comprehensive as any ever advocated for the nation. And yet every experienced person knows there yet remains in such state laws a defect as serious as any lack in the Act to Regulate Commerce. Nevertheless, today, after years of failure, many are following the leadership of men who advocate for the nation nothing that has not been unsuccessfully tried by the states and found to be inadequate. The truth is, there is no connection between the making of a rate and the keeping of it. The first is a function that will produce the same results, whether exercised by a carrier or by a commission.

But while the Commerce Act prohibited pooling, it permitted the carriers to agree to maintain the rates, which by the terms of such act they were required to make and maintain. And so, in a restricted way, the railways were striving, as best they could, without the right to pool or to divide business, to keep the law, when was enacted by Congress the most contradictory piece of legislation in all history. A law was enacted by Congress popularly known as the Anti-Trust Act. Its framers and advocates said, while it was being debated on the floor of Congress, that it was not to apply to railroads. But the Supreme Court said it did. Commanded to maintain rates, and forbidden to agree to do so, told that stability was the one thing the public required, and that instability was the one thing it proposed to have, the owners saw but one practical way in which a company could do what it was commanded to do, and yet forbidden to do, in concert with other companies. And then began the movement which threatens to terminate in a few men directing the affairs of all the railroads in America. This is something all owners do not want, and which many railway officials deplore. It has come as the result of an absurd, contradictory set of laws, that has worked no good for the people, and harmed every interest, except the favored few. Even those who think a single ownership inevitable must concede the time for it has not come. Neither individuals nor the whole people are prepared for such a tremendous undertaking as the management of all the roads as a single concern. Too much is yet experimental for one man's will to be absolute in any of the departments of service with advan-

tage to the public or to the owners. We need the light of much independent direction, the lessons that come from many ways of doing the same thing, while conditions yet remain in the formative state. Nor is there need for great consolidations, if the people will lay aside prejudice. All that the roads require is to be allowed to enter into those arrangements that will lessen the cost of transportation and enable the lines to agree upon plans that will prevent secret rate-cutting and secure stable rates. The question arises: Would that not mean a monopoly? The answer is: It means no more than that the people should tolerate that which they would be forced to accept if the government owned the railroads. Then there would be but one rate. Why should there be today one for me and another for my powerful competitor, who can secure by threats an advantage that may work my financial ruin? It is a sad thought that a principle defended as the life of trade is exterminating the small trader. Before carriers can reduce rates they must be enabled to carry more cheaply. The underlying principle of cheap transportation is density, which, put simply, means that fifty passengers can be carried in a single coach at less cost per passenger per mile than could ten; that to haul two thousand tons in a train enables the carrier to carry each ton cheaper than when only one thousand tons are carried, with the same power and crew. To get the full use out of units of energy is the great economical problem. Larger engines, heavier rails, and stronger bridges have come into use. Today railway officials are asking: If a better use of equipment produces cheaper transportation,

why would not a more prudent use of all the railroads do much more in the same direction? Why haul freight on a high-grade line, when there is a low-grade one? Why send passengers over the circuitous route, when a shorter and safer one is open? Why not give all the public the use of the best line, and carry all the business in such a way that it will be done at the least aggregate cost? This will save in expenses and make possible lower rates. In brief, the principle of density will not have performed its full function until traffic is concentrated on the lines best fitted to carry it. It is one of the strangest phases of this vast subject of transportation that the shipper has wilfully shut his eyes to the fact that he is directly and greatly concerned in every factor of transportation expense, and benefited by every saving. He has seemed to think that only the stockholder is interested in the economies practiced by the companies, when the truth is that every saving benefits the shipper. For it is indisputable that, as carriers have been enabled to carry more cheaply, they have voluntarily reduced rates, and, had they not done so, they would have been compelled to do so. It is the people who pay for every unnecessary agency and every unnecessary train. Ought they not to be willing to work for a cheaper service, if it is also a better service? And, lest there be some fear that such a service might become inferior, I beg to cite a few instances that prove it need not be. Between Boston and New York there is but one carrier; between New York and Washington there is but one interest in control; and there is also but one between Albany and New York; and yet I dare to say there is no better

passenger service in America than is maintained by these three monopolies. We have but one custom-house and one post-office; why have more than one depot? We should become indignant at the suggestion of paralleling a canal, because in such case we should be taxed to sustain an unnecessary public burden. But do we not sustain every railroad, and encourage the construction of some that are not needed? Do we not pay the cost of every train, and yet insist that they shall be duplicated, without reason? The railroad always has been, and always will be, a monopoly to the town that has but one road. There is practically but one line in the greater part of Pennsylvania, and no state has been so dependent upon cheap rates to develop its industries—none more successful. There is but one system today between the Ohio river and the Atlantic coast, and yet the average rate per ton per mile there is the lowest in the world. Of course, these conditions are not due to the generosity of the carrier, but they ought to convince anyone that other causes than competition affect good service and produce low rates; and it ought not to be necessary to argue that the carriers should be allowed to do their business in the way that is most economical, provided some public administrative body is given the power to say how the savings, effected by the maintenance of rates and apportionment of business, shall be divided between the shipper and the company.

But, it will be asked, are the railroads willing to surrender that which they have regarded until now as all that is left them and worth fighting for? I cannot say. But I know there are many who do believe that,

if railway officials are given the right to meet in conference with other officials, to apportion traffic, or earnings therefrom, and to make lawful agreements to maintain rates; and if the companies are given the right to contest in a reasonable way, before a judicial tribunal, such administrative orders as are thought to be unreasonable, and also the right to have the operation of such orders stayed until their reasonableness, in case of dispute, shall have been passed upon by a court—then the commerce commission should be given the right to prescribe a reasonable rate in every case of dispute arising on the complaint of one aggrieved. Can more be asked in reason? For thereby would be given to the people all the benefits of government ownership, while securing them against many of its evil consequences and all of its dangers.

I know of no matter of public concern more important or more urgent than the vexed problem we know no better name for than the railroad problem. It is not a matter of special interest to the few, but one of mighty consequences to the nation. Daniel Webster said that the commerce clause did more than any other in the constitution to induce the union of the original states. If the right to use freely the navigable streams, and trade with each other without unreasonable restraint, was a matter of such moment to the thirteen states, who can measure its value now to the forty-five that are literally bound with bands of steel?

We have proceeded to the point where it is our declared policy to regulate the railroads; the foundation of that policy rests upon the assertion that the railroad is a public agency, and its functions therefore gov-

ernmental. Advancing with that policy, we either have taken or propose to take from the companies those powers which every other industry possesses—of fixing the price at which it will sell its product, and to whom, and under what conditions it will sell at all. With this exercise of great power, let us not forget we have taken on great responsibilities, and, in asserting the right to control, we have incurred the obligation of securing to these public servants the same measure of protection accorded all others.

TRADE AND INDUSTRY

THE STEEL INDUSTRY.

FRANKLIN H. HEAD.

The subject which has been assigned me is the steel industry. To deal with the subject thoroughly in all its ramifications would take a course of a dozen lectures; so I can only give you some of the general ideas upon the subject of the manufacture of steel, its growth, and its great use in the community. I suppose the best way to do this would be to begin at the beginning and to talk to you about steel, at the very beginning of steel, which of course is iron ore. Now, iron is something that is almost never found in nature in a pure state. Oxygen, which, as you all know, is one of the most widely distributed and active of the elements, has a special liking for iron, and it always grabs it and holds to it with all its grip, just as long as it can. In the process of smelting iron ore the two separate and the iron is produced, but the oxygen does not give up the battle. You all know that if you leave a piece of iron or steel exposed to the atmosphere, it gets rusty, as we call it. That is simply the effort of the oxygen to get it back again into its clutches. That rust on the oxidized parts of iron is simply iron ore.

The first step from the ore is to turn it into pig iron. Iron ore is never pure oxide of iron; there is always some silica, and very apt to be some phosphorus and sulphur. These elements all appear to some extent in the pig iron and modify it, so that there are a great many kinds of pig iron. There is no carbon in iron

ore. When the iron ore is to be smelted, a layer of coke is put in the blast furnace, then a layer of ore, another layer of coke, and another of ore; and so on to a height of sixty to seventy feet. When this is subjected to the heat necessary to melt the ore, a certain amount of the carbon combines with the iron; as a rule, pig iron as manufactured contains about 3 per cent. carbon. Now, this carbon is a most important factor in iron activities. Other elements also have a marked effect on the quality of iron. Sulphur makes it very poor and brittle; a good deal unfits it for manufacture. If there is not too much sulphur in the ore, it can be driven off by roasting, but unless the sulphur is expelled, the pig iron is almost worthless. Silicon makes it flow a great deal more freely when melted; it will run like water; and, of course, that is what is wanted to make fine, clean castings, where you want to have sharp corners, as, for instance, in stove castings. A large amount of phosphorus spoils steel, so that you have to be careful not to get an iron that is too high in phosphorus.

Until very recently the next stage in manufacturing steel was to transform the cast iron into wrought iron. This was done in a flat, open furnace, over which swept a flame which first melted the iron and then, while the molten metal was stirred or puddled, burned out the carbon. Other impurities were squeezed from the spongy mass of iron by rolling or hammering, and the product was wrought iron, used in an endless variety of ways.

The next form is the one we are to talk about this afternoon—steel. In the manufacture of steel the object is to eliminate all the silicon and phosphorus, and, in fact, everything except the carbon, of which only a limited percentage is retained. The peculiarities of these three kinds of iron—cast iron, which is really the same thing as pig iron, wrought iron, and steel—are these: Cast iron will not bend; it will break before it will bend. Wrought iron will bend into all sorts of shapes. Steel can be tempered. It is tempered by heating to a red heat and plunging it into water. With cast iron or wrought iron this process makes no difference; but if you heat a piece of steel to a red heat and dip it in water, it will temper it, and make it so hard it will cut wrought iron and cast iron, and even soft steel. These are the distinguishing points about the forms of iron.

The old process for making steel, which existed away back in the early historical period, was, as has been said, to take pig iron and work it into wrought iron. Then it would be iron without any carbon. The plan then was to get some carbon into it. So they rolled it into strips and square bars and various shapes, and put it into a box capable of resisting a great heat, and buried the iron with charcoal or coal, or some form of carbon. Then they would cover it up to make it as near air tight as possible, heat it to a red heat, and keep it there, perhaps for a week or ten days or a fortnight, depending on how heavy the iron was. If the air had got in, it would burn it all up. Keeping the air out and keeping it at a red heat, the iron absorbs the carbon and becomes steel. This old way of making steel still prevails in some few cases with a peculiar quality of steel. That, of course, made steel very ex-

pensive, so that it could not be used for common purposes.

The first man entitled to eminent credit for the modern processes of making steel is Sir Henry Bessemer. The Bessemer process revolutionized the steel industry. By that time we had begun to study the chemistry of iron; before that it had been largely a matter of guesswork. It was discovered that when you take iron that has no carbon, and put in anywhere from ¼ per cent. to 1½ per cent. of carbon, it makes steel. Sir Henry Bessemer conceived the idea of taking pig iron and putting it in a large converter, shaped like a big vase, a vessel the bottom of which is full of small holes through which a blast of air is forced at high pressure. When this is done, brilliant sparks come out like fireworks. Air is thus forced through the converter for from five to eight minutes. An expert can tell by the color of the flame when the carbon is burned out, and when it is burned out the draft is stopped.

Bessemer's first idea was not successful. It was that he would start out with pig iron, for example, with 3 per cent. carbon, and burn out 2 per cent. and then stop. But that was very unsatisfactory, because they could never make it twice alike. It looked as if the process could not be a success. But somebody working with Bessemer conceived the idea of burning out all the carbon, then adding more melted iron that contained a good deal of carbon, the amount of carbon being exactly known. For example, if there were ten tons of iron to be converted into a steel containing 1 per cent. of carbon, all the carbon in the iron would be burned out in the converter, after which two tons of iron

containing 6 per cent. of carbon would be added, which would make twelve tons of metal with 1 per cent. carbon, that is, twelve tons of steel. In this way very satisfactory results were obtained, and the Bessemer process is used to a very large extent today. Most steel rails are made by the Bessemer process, and it is a very satisfactory process, although it is not capable of the exactness of some of the other methods. But it is sufficiently uniform for practical purposes, for heavy work.

The Bessemer process was for a time hampered by the difficulty of obtaining iron ore practically free from phosphorus, for in its original form the Bessemer process did nothing to eliminate that most harmful of elements. A later improvement, which lined the converter with dolomite or other basic material—hence giving the name of the "basic Bessemer process"—allowed the process to be extended to many ores which otherwise would have been excluded because of their high phosphorus. This process is of great importance in England and in our southern states, where non-phosphoric ore is scarce. In this part of the country the supply of suitable ore is so great that the basic Bessemer process is little used.

There is another steel made in increasing quantities, and that is known as "open-hearth steel." There is very little iron destroyed; every year in this country we make perhaps twelve or fourteen million tons of new iron. That goes into all sorts of operations and shapes, but does not disappear; after a while it comes back again as scrap, as old railroad rails, for example. All sorts of machines, wagon tires, etc., give out every year, and in that way an enormous amount of steel or

scrap iron comes back into the market. The cast iron is melted over again, the wrought iron is worked over, and a great deal of use is found for the scrap in making steel at the open-hearth furnace. The open-hearth furnace is shaped like a wash-basin, large enough to hold about fifty tons of iron. In it is put a certain amount of pig iron, containing a known percentage of carbon. Then they put in a large amount of wrought-iron scrap, which does not hold any carbon. The proportions of scrap, pig iron, etc., depend on what kind of steel is desired. The materials are melted in the open-hearth furnace and kept there at a high temperature for eight or ten hours. In that time all the impurities in the iron will come to the surface, forming a slag, so that the steel made by the open-hearth furnace is better and more uniform than Bessemer steel. You can see that in sending the air through the converter there would be some places in the mass that would not get their proportion of air, while in other places the air in passing through the melted iron would take up a little of the iron, producing iron oxide; so that a careful analysis of Bessemer steel will always show a little iron ore. That does no harm in making steel rails, but for fine steel it does not answer to have anything like this. In the open-hearth furnace it becomes perfectly uniform, and the impurities come to the surface, producing a very fine quality of steel. The open-hearth process, on account of the enormous mass of scrap iron going to market, is being used more and more, and it looks as if the open-hearth process would supersede the Bessemer. It gives us more uses for our scrap iron and makes a little better steel.

There is still another grade of steel, which I will touch on briefly. It is "crucible steel"—the finest made, used for the very finest work, such as springs, in which it is necessary to have great uniformity and great elasticity. This is made of the best wrought iron with sometimes a little steel scrap. The wrought-iron scrap is cut up into pieces and put into crucibles that hold about a hundred pounds. To this is added carbon, in some form, in sufficient quantity to produce the desired quality of steel. The crucible is sealed (though it is difficult to make it airtight) and put into ovens and heated so that the steel is melted, and kept at this high temperature eight or ten hours. In that way it becomes perfectly uniform, and if there are any impurities they come to the surface and are taken off. It has almost perfect uniformity, and any desired quality can be made with certainty.

I think I have given you now in a general way an idea about steel and the different kinds of steel. Some people need hard steel and some soft, and we get them in these various ways. The whole modern steel industry has grown out of the application of chemistry to the mechanical arts. The great work that has been done in steel has been done by the chemists. If you go to the steel manufacturer and say, "I want one thousand tons of pig iron, 2 per cent. carbon, less than 0.1 per cent. phosphorus, 2½ per cent. silicon, and no sulphur," or any other formula, he can make that for you with the accuracy of a woman mixing the ingredients for a cake. It is due to the constant application of chemistry to the mixing of the ores and the melting of the iron.

The field for the use of steel, since it has become so

cheap, has greatly widened. For instance, lumber is beginning to get scarce and high; we have from Chicago to the Rocky Mountains a country poor in timber, and the cost of fencing that country with lumber would almost be more than the farms are worth. Before they began to use steel so abundantly, they tried to make wire fences out of iron wire. It was soft, and if a steer moved against it, it stretched and sagged and fell. The steel wire is a great deal harder and stiffer; and they put a few barbs on it, to make the cattle uncomfortable, and they made a fence that has taken the place of lumber from here to the Pacific. The saving in transportation is marvelous; for one carload of wire fencing will make more fence than a long train of lumber.

There have been two great advances within the last hundred and fifty years in the cheap production of iron. One is the hot blast. In the old days cold air was used in the blast furnace. Now the air is heated to about the temperature of melted lead before it is admitted to the furnace. This reduces the amount of coal necessary. Forty or fifty years ago it took six or seven tons of coal to make a ton of iron. Now it is made with one ton of coal to a ton of iron. Mr. Carnegie, the most successful steel-maker in the world, has made a ton of iron with a little less than 1,800 pounds of coal. You can see what an enormous change that is, to make a ton of iron with one-sixth of the coal that was formerly necessary. This aided in the production of cheap steel.

Another great step was made by Siemens, who invented the regenerative furnace. The principle on which this works is very simple. Suppose a furnace

like the open-hearth furnace. Into this two passages lead, and these passages are filled with holes every six or eight inches, with bricks laid between them; so that about half the space is filled with bricks, between which the air passes. The first step is to pass the gas among the bricks and let it burn among them, and in a little while it heats them to a white heat—almost to the point of melting iron. When it gets to that point, the air that is going into the furnace is sent through this chamber heated almost to the melting-point. At the same time the set of bricks in the other passage is being heated. As soon as the first chamber begins to cool, the other is white-hot, and the air is switched from one to the other, so that it always reaches the furnace at a very high temperature, having taken up heat from the heated bricks through which it passed. This invention has also enormously reduced the cost of making crucible steel. There is another regenerative furnace described by Dante, in his great work, in the section called purgatory; the two furnaces are entirely different, and should not be confounded.

I have finished what I want to say to you about the manufacture of steel, and I wish to say a few words in conclusion in regard to the wonderful benefit to the world from the invention of cheap steel. And for that purpose I wish to quote some texts.

The first text is a sentence from Milton: "Thus was modern luxury of commerce born." There have been very few more pregnant and wonderful sentences ever written; luxury is born of commerce. You have all read that at one time in England a new officer was appointed whose duty it was every day to go to

the king's bedroom and to stir the straw that he slept on, and see that there were no daggers in it. Straw probably was looked upon as a luxury at that time. A definition of luxury would perhaps be that everything that is not an absolute necessity of life is a luxury. Everything we have in life would have been a luxury one hundred or two hundred years ago. All this growth of luxury comes from commerce; it is the source of all luxury and wealth and development. One farmer has some wheat that he cannot use, and he exchanges it with the merchant for something else, and each makes a profit; the farmer, by getting something he wants, and the merchant by selling his goods and getting a profit on them. And the nation that is a great commercial nation is a wealthy nation. All through history the wealthy nations have been commercial nations. The United States is going to be a richer nation than was ever before known. The developments of the last five or six years have shown that England must look out for her supremacy. It looks now as if the United States was going to be the prominent industrial nation of the world, and, if so, it will be owing to commerce. This commercial power is due to the invention of the steel rail. Go back forty years, when the railroads all had iron rails. We do more business every day now than in forty then; but then the average life of a rail under moderate usage was eighteen months. The whole system had to be taken up and new rails put in, and the old rails were sent to the rolling mill and made up into new rails again, at a cost of about one-half of the original cost of the rail. It is difficult to say

just what is the life of steel rails as compared to iron rails, but it is safe to say that one steel rail will outlast fifteen iron rails.

But that is not all; the rails not only last so much longer, but cars last much longer. I can remember very well when if you were traveling you could not talk with anybody in the car, on account of the thump, thump at the end of the rail. If you wanted to talk, you had to shout at the top of your voice. The result of the jerking and pounding was the loosening of the bolts and nuts in the car, and the cars had to be constantly taken to the shops for repair. Since I have been connected with the iron industry, it was considered a bold manufacturer that would give a guarantee that his car-wheels would run 30,000 miles. Today similar wheels are guaranteed to run 150,000 miles.

Let me give a couple more texts: At the time of the World's Fair some of you saw the Transportation Building; and at the entrance to that building there were two inscriptions, one on each side of the arch. The first was this sentence from Lord Bacon, one of the wisest men of the time of Elizabeth; but he couldn't write poetry, or plays: "There be three things which make a nation great and prosperous: a fertile soil, busy workshops, and easy conveyance for men and goods from place to place." You see good transportation is one of the three things that make a nation great. The other text is from Macaulay: "Of all inventions, the alphabet and the printing press alone excepted, those inventions which abridge distance have done most for civilization." You see that in both these marvelous sentences Bacon and Macaulay place great

stress upon the value of easy transportation from place to place—abridging distance.

Chicago is one of the examples of the wonderful growth of a city growing out of the use of steel rails. Before that the great routes for settlement lay along the edges of lakes and rivers. The finest farm in Illinois that was twenty miles from a lake or river was scarcely worth cultivating; it cost so much to get everything to market. And when they had built the railroads with iron rails, these rails wore out so fast, and cars wore out so fast, that transportation rates had to be very high. It cost probably five times as much as it does now to move freight. It is the lowering of freight rates which has given Chicago its impetus to growth. Of course, we cannot grow unless the country grows with the city. The country starts the wealth; it starts with the ground. But the country has to have some market for its product. So the railroads are what have built Chicago. I do not know whether you have looked into the problem of how cheap transportation has been made at present. Statistics show that during last year the price the railroads received was a little under nine-tenths of a cent for every ton per mile. They would carry a ton a mile for nine-tenths of a cent. Of course, there were a great many classes of freight, valuable merchandise, and bulky goods that cost several times that; but, on the other hand, enormous quantities of freight were carried last year from here to New York at a quarter of a cent per ton per mile. The most that a farmer would be able to bring to market on a wagon would be about a ton. That is as good an illustration as I can give

you of the benefits of cheap transportation, and this benefit grows out of the invention of steel rails.

Another thing that it is safe to say is that for every dollar put into the railroads the value of farm property has been increased ten dollars.

There is another method of transportation, very cheap, which is much used in some parts of the country —the transportation of liquids by pipe-lines. In that way liquids are transported great distances at almost insignificant cost. This cheap transportation of petroleum has been one of the foundations of the fortunes which have endowed great universities, and have brought within the reach of a very large class of people the advantages of a higher education.

I will close my remarks by telling you one incident which ilustrates how little people realized what was coming with the invention of the steel rail. Twenty-five or thirty years ago a very brilliant essayist lived, James Parton. Among other things, he wrote a series of papers about the great cities of the West. He gave Chicago credit for being a wonderfully enterprising town. It had then about half the population of St. Louis. St. Louis was a city a hundred years before anybody lived in Chicago. Parton, when he came to talk about St. Louis, said it would always be the great city of the interior West; that Chicago had no chance whatever in the long run, because she had to depend very largely upon railroads, and railroad transportation was enormously expensive as compared with water transportation; and so she could never have a large area of country tributary to her. When a farm was nearer the Mississippi than to Chicago, everything

would go to the Mississippi; and therefore St. Louis would always be greater than Chicago. The article made quite a sensation. St. Louis was delighted, and we were depressed, for it looked as if his reasoning was almost unanswerable. He gave the figures for the actual cost of railroad transportation. But time has made that wonderful prophecy into something we can laugh at. This development of Chicago was made possible by the wonderful development of the steel industry.

I hope I have said enough to make you feel that the steel industry is a great industry—one of the great industries of the world, that will make us the dominant commercial power of the world, because we can make steel cheaper in this country than anywhere else. The iron and coal mines of England have been worked for hundreds of years. In a large part of the mines of England it costs more to pump the water out of the mines than it does to mine the ore and put in on the cars. With the great advantages of cheap iron and of cheap transportation, made possible by the invention of steel rails, we shall be the dominant commercial nation of the world.

THE HISTORY OF THE ART OF FORGING.

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In the art gallery of the home, in Philadelphia, of the late Joseph Harrison Jr. hangs a large oil painting by the celebrated German artist Schussele, entitled "King Solomon and the Iron Worker," in which is portrayed an imaginary scene at a feast supposed to have been given by King Solomon to the chief artisans who had taken part in the construction of his temple. At the right of the throne is shown the seat of honor, which the king had announced would be reserved for the one who, as those present should decide, was the master-workman of them all. To the surprise of the assembling guests, this seat is found to have been already pre-empted by a swarthy laborer, who is a stranger to those to whom Solomon appeals for information regarding him. The king is about to order the guards to remove the unbidden guest, when the latter asserts that he has come in response to the general invitation extended to the workmen, and asks those who had just denounced him, who made the tools and instruments with which they had respectively cut the stone, hewn the timbers, fashioned the gold and silver, and carved the ivory which together composed the structure and adornment of the edifice. They one and all declare that "the blacksmith" had supplied them with the means whereby their work had been accomplished. Whereupon the repudiated guest an-

nounces that he is "the blacksmith," and that by the rules of the contest he is entitled to the chair in which he is seated, for all the other claimants have acknowledged that without his work first theirs could not have been performed. Solomon at once recognizes the cogency of his argument and awards the prize to him as his just due.

The position of the forgeman among artisans has in no whit changed since the time of the legendary incident which has just been portrayed. It can, in fact, readily be maintained that the art of forging has always held a dominant position in the history of mankind. It can also be safely stated that the influence upon civilization of the iron and steel industry, of which the forge has always been the leading exponent, has been greater than that of any other manufactured product. For, as in early times, the sword and other hand-weapons, together with shield and helmet, all products of the forge, determined the rise and fall of nations, so later, as methods of forging improved and guns and armor-plate modified the game of war, those nations which possessed the better implements of warfare superseded those that were armed in an inferior manner. In time of peace tools made of iron and steel have ever been foremost in aiding the development of all those arts which have made progress possible.

Research is unable to determine regarding the beginning of the forgeman's art. Legend, tradition, and early history lead us to conclude, not only that it is lost in the dim and distant past, but that it even assumed considerable proportions long before the time when written records were made.

Most ancient nations attribute the discovery of iron to some god; the Egyptians to Osiris, the Romans to Vulcan, the Germans to Wodin, the Greeks to Kadmos; while Hebrew tradition accredits it to Tubal Cain, who, according to their chronology, lived about 3,000 years before Christ. These divinities, enthroned in the clouds or on the summit of the highest mountain peak in the land, when in angry mood would hurl thunderbolts at their enemies. Fragments of meteors occasionally reaching the earth kept up the illusion. It has even been assumed by some, from the fact that the Egyptian word signifying iron was *benipe,* meaning "stone of the sky," and the Greek word *sideros,* of similar import, that the first wrought-iron implements were made from iron of meteoric origin. Not many of these stones, however, reach the earth, only about 650 having been found within the knowledge of man; and as only a small percentage of them fell in that part of the world occupied by the ancients, it is probable that very few forgings could have been made of iron from this source.

When we consider that iron and steel are easily oxydized by exposure to the elements, and that climatic conditions must be very favorable to preserve them for any great length of time, it is certainly very remarkable that any of the products of the forge should be preserved to us from very early times. Nevertheless, we are in possession of numerous remains of forged iron and steel implements of various kinds found in Europe, Asia, and northern Africa, under conditions which preclude all possible doubt of their prehistoric origin. Even if, however,

there were no such relics of this early craft left for us to see, we have abundance of indirect, but absolutely indubitable, proof of its existence in the remains of prehistoric engineering and architectural works which could not have been accomplished without the aid of iron and steel tools.

In Egypt, Menes, the oldest known king, whose reign began 3892 B. C., by enormous artificial stone dams changed the course of the Nile to protect the city of Memphis. His immediate successors built the pyramids. Such gigantic works could not have been executed without the use of iron and steel tools, and a numerous population thoroughly skilled in the mechanic arts. Mr. J. K. Hill, an Englishman, in 1837 found a piece of iron between two stones while blasting in the great pyramids of Cheops. It was evidently a portion of a tool, and was apparently lost between the joints of the stones while building. This pyramid was erected about 3000 B. C. This is the oldest piece of iron known to be in existence, and is preserved in the British Museum.

According to Chinese legend, iron was known in that country during the reign of Hoang-ti, who lived about the time of Tubal Cain, 2600 B. C. Knowledge of the working of this metal, however, must have been antecedent to, or concurrent with, that of the lodestone, the use of which in the compass has been traced to the reign of this emperor.

When the Philistines overran Syria, they carried the Phœnician iron-smiths into captivity to prevent their making arms and weapons for the Jews. The latter were wandering tribes and possessed no skilled

mechanics. Tyre and Sidon, the two principal cities of Phœnicia, were rich and prosperous, and contained many evidences of the iron-smith's art. David's palace and Solomon's temple were designed and built by Tyrians, 1565 B. C.

The Chaldeans, whom Josephus calls the descendants of Tubal Cain, the Assyrians, and the Babylonians, all were familiar with iron from the earliest times. Preserved in the British Museum are implements of war and agriculture which can claim a date of manufacture 1500 B. C. The stones in the foundations of the bridges built by these people were held together by iron clamps. The magnitude of the cut stones forming their palaces and temples shows that iron and steel were known to them, for nothing else could have cut them. Some of these stones exhibit annular borings, testifying to the use of an instrument similar to our modern diamond drill. The early literature of all ancient nations speaks of iron as a part of the tribute paid by conquered foes.

In India there are temples cut from the solid rock, and steel tools which probably did the cutting have been found in graves in this country which date back to 1500 B. C. The *Rig Veda,* of a little later date, speaks of iron. In the Museum of the New York Historical Society are an iron helmet with chain neck-guard similar in design to those used in mediæval times, also a breast-plate composed of scales, one of which, in the shape of a cartouche, has stamped upon it the name of the Egyptian King Shishac, who invaded Jerusalem 971 B. C. These were taken from a tomb during excavations at Thebes by Dr. Henry Abbott,

and their genuineness has been verified by such archæologists as Sir Gardner Wilkinson, Lepsius, and other high authorities.

In Persia also stone ruins testify to the fact that iron was known at a very early date; mention is made of this metal in the *Zend Avesta,* written about 1100 B. C.

Hesiod and Homer, Grecian contemporaries, about 900 B. C. both refer to the forging of iron. The latter in Book XXIII of the *Iliad* speaks of a huge iron quoit being one of the prizes at the funeral games given by Achilles in honor of Patroclus.

The author of Genesis, writing a century or more later, and other biblical writers of Arabia, Ethiopia, and Mesopotamia, refer to the forging of iron.

The moist climate of Mexico and Central and South America is fatal to the preservation of iron and steel, but enormous statues of porphyry are frequent, and these could not have been sculptured without the use of steel tools, and these made of steel of most excellent quality. Even our present knowledge of metallurgy is taxed to its utmost to obtain tools capable of cutting the black basalt of Nicaragua from which so many statues in that country are carved. Some of this work was cut out in very minute detail, as, for instance, the sacrificial stone and calendar stone of the Aztecs. Some of the stone was soft, and was probably cut with instruments of stone of a harder nature, but these latter must have been made by *steel* tools, for nothing else could have made them. Such gigantic works as the water conduit in Peru, five hundred miles long, cut into and tunneled through the hardest rock, and the great highway built by the Incas

from Quito to Chile, twelve hundred miles long, twenty-five feet wide, and cut out of the solid trap porphyry, could not have been made by any other means than through the instrumentality of steel tools.

There is, however, much room left for speculation as to the metallurgical methods and mechanical appliances adopted by primitive man in the manufacture of the early products of the forge. It is, nevertheless, probable that the earliest methods of iron-smelting consisted in placing lumps of ore in a fire of wood or charcoal, located generally on the windward side of a hill, and after a lapse of sufficient time to permit of their more or less complete reduction, hammering the spongy metal thus formed into the desired shape. So that what is now known as the Catalan forge, from its use in Catalonia, Spain, in more modern times is but a comparatively slight modification of or improvement upon the oldest metallurgical appliances for the extraction of iron from its ore, the main differences being in the size of the apparatus and the use of an artificial air blast. Even the latter can by no means be considered a modern appliance.

Egyptian sculpture on the walls of the tomb of Thothmes III. at Thebes, of date 1500 B. C., shows the character of forge and bellows used at that time. On the forge was heaped the fuel, over which is a conical vessel resembling a modern crucible. The bellows consisted of leather bags secured and fitted into a frame, from which a clay pipe extended for conveying the air into the fire. They were worked alternately by the feet, the operator standing upon them with one under each foot. The air entered through a hole on

the top of each bag, which was closed by the heel during the downward pressure. The entrance of the air was effected by pulling up the top of the exhausted bag by a string held in the hand. Having no accurate knowledge of chemistry or metallurgy, the forging of metals was for centuries in the state of an art, and the quality of product in any locality was largely governed by the grade of ore found there, the purer grade reducing readily to soft wrought iron, while the more impure produced a harder wrought iron or inferior grade of steel. Steel, being an alloy of iron with other elements, and representing considerable progress in the science of metallurgy, came later than wrought iron and was probably contemporaneous with bronze. Steel was made by taking advantage of the affinity of wrought iron for carbon. The process of manufacture consisted in surrounding wrought iron by carbonaceous materials in immediate contact with it and subjecting them together to continued high temperature. Carbon is absorbed by iron at the rate of about one-eighth of an inch in depth in twenty-four hours, the more carbon entering into the iron, the harder being the resultant steel. This is the oldest of all known methods of making steel, and its general use continued with various improvements and modifications of a minor nature until the middle of the eighteenth century. Steel thus made was called "converted" steel, from its method of conversion from wrought iron. The process later became known as the "cementation," or hardening process of making steel. It is true that there was a process of casting steel known in India as early as the fourth century B. C. and mentioned by

Aristotle 364 B. C. It consisted in heating on a charcoal hearth in clay crucibles, the covers of which were luted on with clay, about a pound of wrought iron cut into small pieces with about 10 per cent. of dried wood. The product of this process was known as *wootz,* but it amounted to little in the commerce of the world and is mentioned here only because it is the earliest known process of making cast steel.

Schliemann, in excavating among the tombs of Mycene in Greece, which was laid in ruins by the Argives in the fifteenth century B. C., found thirty-two feet below the surface of the ground a dagger of steel four inches long, with a double-edged blade of arrow-form one and six-tenths inches wide. This is the oldest piece of steel found up to the present time.

Daimachus, a Greek writer at the time of Alexander the Great, B. C. 355, says of the various makes of steel then in use: "The Chalybdic is the best for carpenter's tools; the Lacedæmonian for files, drills, gravers, and stone chisels. The Lydian also is suited for files and for knives, razors and rasps."

Preserved in a glass case in Pilgrim Hall, at Plymouth, Mass., is the famous Damascus sword of the redoubtable Miles Standish. The catalogue says: "The Arabic inscriptions on the blade had always been a puzzle and remained undecipherable until Professor James Rosedale, of Jerusalem, with a troupe of Arabs from Palestine, visited the town in 1881. Mr. Rosedale, being an excellent linguist, was shown the sword and pronounced the inscriptions to be of different dates, one of them Cufic, very old, and the other in mediæval Arabic. He had no doubt that the weapon

dated back two or three centuries before the Christian era, and might be much older."

Pliny, writing 23-79 A. D., states that the conditions requisite to obtain the best temper in steel had been examined into at that time, and recommends water as best for quenching certain steels, although oil was preferable for small articles.

The difficulties which Rome encountered in conquering Spain were chiefly due to the superior arms of the Spaniards. The arms of the Gauls were also superior to those of the Romans. The Roman arms were heavy and of a poorer quality of iron.

The Britons knew how to forge iron before the invasion of Cæsar in the year 50 B. C. Cæsar speaks in his *Commentaries* of their furnaces for making iron, saying that "they resemble those of the Gauls." He also praises the armament of their cavalry, consisting of broad swords and powerful spears, and of their chariots armed on their axles with scythes.

The Romans exerted a decided and permanent influence on Britain. The emperor Hadrian erected in 120 A. D. at Bath a large factory for the manufacture of arms for the Roman army. These works were in constant activity until 409 A. D., when the Romans were driven out of Britain.

Ancient iron forges must have been crude affairs, and mechanical appliances uncouth and clumsy, yet the men who operated them produced results that excite our wonder at the present day. At a time when it is supposed that but a pound of wrought iron could be worked at a charge, we find that forgings of considerable proportions were made of this metal by taking advantage of its property of welding. The most remarkable instance of this kind of work—and it is today acknowledged to be a metallurgical paradox—is a cylindrical wrought iron pillar erected at the entrance of the principal gate of the ancient mosque of the Kutub, near Delhi, India. An inscription in Sanskrit assigns its erection to the fourth century A. D. It is slightly tapered from sixteen inches diameter at the base to twelve inches diameter at the top. It is surrounded by an ornamental capital three and a half feet high. Its total height is twenty-three feet eight inches, and its estimated weight between six and seven tons. It is bulbed shape under ground and leaded into a stone foundation.

In the Black Pagoda at Kanaruk, in the province of Orissa, are iron beams twelve feet to twenty-three feet long, and eight inches to twelve inches square in section at the ends. Some of the eight-inch beams taper to eight inches by eleven inches in section at the center, the greater depth at this point showing aptitude in correct design at an early date.

During the early years of the Christian era and down through the Middle Ages forged articles of iron and steel for purposes of warfare reached a high degree of perfection among those nations of the European continent who were foremost in affairs of the world. The smith of these days was generally a serf, practically a slave to the reigning lord or baron. His time was his master's, and as the noble robber barons controlled nearly all the wealth of the land and were very proud of their picturesque strongholds, they could employ their smiths for months, or even years, on a

single piece of work that would add to the beauty of their domain. The church vied with the barons in wealth, and spent enormous sums in the building of cathedrals and monastical establishments. Hence we can understand how much wonderful work came into existence.

England's iron industry was of little consequence during the Middle Ages. During the fifteenth century it began to improve and expand. Henry VI. encouraged the immigration of miners from the continent. Richard III. prohibited in 1483 the importation of certain articles made of iron, such as needles, hunting-knives, scissors, hearth-fenders, nails, locks, spurs, stirrups, coats of mail, and iron candle-sticks. From thence on the development of the iron and steel industry was as rapid in Great Britain as on the continent. Not only were implements of war of considerable size and beauty manufactured, but wrought iron was largely used in decorative art. Ornamental door-hinges, gates, fences, balconies, candlesticks, lanterns, torchholders, public fountains, etc., were made in great quantities and elaborate designs. These show, not only that a high degree of workmanship had been then attained, but that the genius of the modern inventor has not improved to any marked degree upon some of the articles which are of common use in decorative art now as they were then.

The wrought-iron gates which guarded the entrance to the German exhibit at the World's Fair at Chicago were not more beautiful nor elaborate than some of this mediæval art work. In the museum at Prague is a gate which would puzzle many a blacksmith of our day if he were asked to duplicate it. It

is a network of iron rods interwoven one into the other, of which each mesh required at least two welds. The meshes are approximately two and a half inches square, the rods about five-eighths of an inch square, and the grating over all about seven square feet. Thus we see that malleability of iron furnished a suitable material for the handicraftsman and artist-smith. For as we speak today of the artist-painter and artist-sculptor, so we may speak of the artist-smith of the sixteenth century.

Nor has this type of workman vanished altogether from the trades at the present day. In the court of honor of the German section at the last Paris exposition stood a notable and unique group forged out of iron which had been ordered by Emperor Wilhelm II. from the German firm of Armbruster Bros. This group consisted of a magnificent eagle of heroic size, with outspread wings, struggling with a gigantic dragon which it holds down by its talons. The group symbolizes the contest of liberty and truth with oppression and superstition.

Such work represents what can be done by manual skill and muscular energy. Development in the sciences of chemistry and metallurgy was slow and man worked laboriously for years by dint of acute eye, cunning hand, strong arm, and stalwart courage at subduing the elements. At this time all men were armed, and the sword, being the principal weapon of defense, was valued highly, and its manufacture received the keenest attention. A good sword was baptized by the priest and given an endearing name. Its services were extolled in song, and its maker ranked high in the social scale and popular esteem.

Sword blades made at Damascus in Arabia, and Bilboa and Toledo in Spain, and in Japan, reached a point of excellence which has never been surpassed. This was when life depended upon the protection of personal armament. These swords were made by hammering together a little pile of steel plates into a single flat bar six or eight inches long by a couple of inches wide and perhaps a half inch thick. This bar was then doubled over end to end and hammered out to a bar about the same size as before; then doubled again and so on until it had been folded and hammered out fifteen times. Three more such bars were similarly made, and the four bars were then welded upon one another, and the resulting bar doubled on itself five times, and finally hammered out to the required size and shape. The result of all this heating and working was a thoroughly homogeneous structure. A little calculation will show that the finished sword is composed of over four million layers.

A beautiful example of the swordsmith's work is a sword engraved by the celebrated artist Albert Dürer about 1495 A. D., which came from Nuremberg, his native town. The engraving on it shows St. George and St. Christopher on one side, and the miraculous conception of the Virgin, and St. Theresa with wafer and cup, on the other side. Swords in Henry VII.'s time had a strengthening rib in the sides which can be distinctly seen.

Next to the sword-smith of importance industrially and socially stood the armorer who made the helmets and iron covering for man and horse. In the tenth century the armoring of the whole body became universal; the thirteenth century witnessed the armoring of the horses.

The artistic treatment of arms and armor reached its highest development during the sixteenth century. The perfection in execution of intricate and delicate design was frequently equal to that of the goldsmith's art. The work of the mediæval sword-smith and armorer are used as models today.

A famous set of armor was that of Christian II. of Saxony, now in the museum at Dresden. This was made by Anton Pfeffenheuser, of Augsburg, in the beginning of the seventeenth century, and cost about $8,500. The work of both the sword- and armor-smiths was projected on a large scale under a factory system, and the division of labor was carried out with extreme detail. The forgers, temperers, grinders, etc., formed their own guilds, whose members were bound by solemn oath not to leave the country and not to impart their respective trade secrets to any but their own sons, or, in the absence of the latter, to their nearest blood-relation.

The guilds of the iron and steel workers considered themselves very aristocratic. No boy was taken as an apprentice who was not the legitimate son of honorable parents. Children of night and gate watchmen, barbers, musicians, millers, tanners, weavers, shepherds, and tax-collectors could not become iron and steel workers, because their parents were engaged in dishonorable trades. It was the custom at the death of the forgeman or smith to cremate the body and bury the ashes under the anvil in the smithy.

In St. Peter's churchyard at St. Albans, England,

the following lines appear on the tomb of one William Braithwaite, blacksmith, who died in 1757:

My sledge and hammer lie reclined,
My bellows, too, have lost their wind,
My fire's extinct, my forge decayed,
And in the dust my bones are laid;
My coal is spent, my iron's gone,
My nails are drove, my work is done,
My rusted corpse is here at rest,
My soul soars, smoke-like, to be blest.

During the fourteenth and fifteenth centuries these guilds attained great importance politically, and this importance, although altered in character, exists in the present time in Europe.

During the years from the third to the sixth century A. D. barbarous nations overwhelmed Europe, overcoming the civilization that Rome had instituted, destroying seats of old industries and prosperous marts of trade. But iron was indispensable for the carrying on of war, and for this reason the iron industry suffered least amidst the general ruin.

War destroys and at the same time is the incentive for the creation of new things. The oppressed must rack their brains to invent ways and means to overthrow their oppressors. The ruler must circumvent attempts of the ruled to overthrow him. "Necessity is the mother of invention." This hostile rivalry breeds productve genius in all branches of industry, and thus promotes progress in civilization. As implements of war became more effective, wars became less frequent and of shorter duration.

With the introduction of gunpowder in the thirteenth century came about a complete revolution in the manufacture of iron. The old-style weapons disappeared and firearms took their place. Forgings of larger size became necessary. During the early part of the fourteenth century a beginning was made in the use of water-power for driving machinery and appliances. Thus for a while this power was used to produce the blast for the forge by means of a curious contrivance called the "trompe." This worked on the principle of a falling stream of water entraining air, which became imprisoned under pressure in a box constructed with an opening at its base so small as always to hold water above it. The air was drawn off to the forge through a twyer or pipe suitably arranged.

The Catalan forge of the thirteenth century received its air-blast by this means. Later, however, as mechanical ingenuity improved, a water-wheel was connected with a shaft which by crude cams and levers opened and closed a line of large bellows, which gave a continuous blast to the fire. From this advance in power the size of the furnace grew, and Dud Dudley brought it to perfection by the use of coke during the latter part of the seventeenth century.

With the increase in the facilities for the production of iron the demand grew in every direction, and metallurgical knowledge progressed rapidly, with a consequent improvement in the quality of iron and steel. The process of making steel previously described produced what was known in the trades as "blister steel," from its peculiar blistered appearance. When this steel was heated and worked under the hammer, it was known as "shear steel" or "single shear." When the latter was broken into short lengths, piled, heated, welded, and finished under the

hammer, it became "double-shear steel." These steels got their names from the shears employed for cropping woolen cloths, for the manufacture of which they were extensively used.

The limitations of the then known process of making "blister steel" by surrounding wrought iron with carbonaceous materials confined its product to pieces of small proportions. Although this type of steel is of ancient origin, it is interesting to note that no development in its manufacture took place during the time when it was the only process known of making steel, and although until a little over a hundred and fifty years ago it was the standard steel of commerce, it has only within the past fifty years been entirely superseded by metal produced by a process of melting in crucibles; and with the introduction of this process, and of others growing from it, has come about a revolution in the steel industry which, it has been said, has brought about more development and advance in civilization than were caused by all previous inventions of man put together.

This came about initially through the efforts of one Daniel Huntsman, a clock-maker, in 1741, at Handsworth, near Sheffield, England, in furnaces which are still standing, who, experiencing great difficulty in obtaining reliable steel springs for his clocks, made practicable the process of making crucible steel. This process Huntsman tried to keep secret, but it was finally discovered, and improved upon and brought to perfection by others.

It consisted primarily in melting "blister steel" in conjunction with other necessary elements in closed

crucibles. At first the contents of the different crucibles were not sufficiently uniform in composition to allow of mixing, and the size of steel forgings was limited to the amount of steel contained in one crucible. Later, as metallurgical knowledge increased, the contents of many crucibles were poured into a ladle and mixed, and the resultant mixture cast into molds of suitable shape, from which larger forgings could be made.

Meanwhile, the science of chemistry was assuming practical accuracy, and the forging industry was still further advanced in 1784, when Henry Cort, of Gosport, England, invented the "puddling process" of making wrought iron, thus materially increasing the output of this product. This process consisted in melting refined pig iron in a bath of cinder on the sand bottom of a reverberatory furnace by means of an oxydizing flame impinging upon it and stirring the pool or "puddle" of molten metal to present that portion which was underneath to the influence of the flame, and thus burning out all impurities and leaving pure iron. It was improved in 1804, by Samuel Baldwyn Rogers, of Naut-y-glo, Monmouthshire, England, by the substitution of iron plates for the sand bottom of the furnace, and the use of iron ore as the chief source of oxygen necessary to decarbonize the molten metal. Mr. Rogers suffered the fate of all reformers in not having his improvements appreciated at the time. About the only recognition he received for his invention was the nickname "Old Iron Bottoms."

Hot air for the furnace blast was first introduced by James Beaumont Neilson, of Glasgow, in 1828, and effected a great saving over previous practice.

Man is an imitative animal, his first tool, the hammer, being probably copied from the uplifted hand grasping a stone. This is still not only the simplest, but also positively the most important, tool in use. Without its pioneering blows other tools could not have been fashioned, and the materials of which they are composed would have lain dormant in the earth's crust forever, for the ringing of the anvils under the beating of hammers was the absolutely essential overture to the great opera of the civilization of the human race.

As the demand for heavier work increased, the size of the hammer also grew, its design being simply a magnified hand-hammer, and this was operated by water-power long after James Watt developed the steam engine. But steam in time forced its way into the industry. The steam-hammer in its modern form was the product of the fertile brain of James Nasmyth, in 1838, then of Scotland. He evolved this tool, practically the same as it stands today, in response to the demand made upon him to turn out a larger forging than had ever been made.

The Great Western Railway Co. of England having already successfully dispatched a very large steamer, the "Great Western," to New York from Bristol, decided to construct another and larger steamer, the "Great Britain," for the same line. The company was, however, perplexed regarding the manufacture of the paddle-wheel shaft, which was to be of a size larger than any heretofore attempted. They applied to Mr. Nasmyth, who in a few days drew the design for a hammer of sufficient capacity to forge the

wrought-iron shaft required. Before the order for the shaft was given, however, the design of the steamer was changed by the invention and introduction of the propeller by John Ericson in 1842. The hammer was not built, but the drawing was completed and hung in the main office of the iron works exposed to the view of visitors. Some three years afterward, during a visit of Nasmyth to the works of Henri Schneider & Co., at Le Creusot, France, he was surprised at the size of some forgings which he saw lying about, and asked by what means they had been made. "By your hammer," was the answer. Further inquiry elicited the information that a year or more previously Mr. Schneider and his superintendent had visited Nasmyth's works in England, and, seeing the design of the hammer upon the office wall and appreciating its great value as a forging tool, had on their return home built one in conformity with it. Mr. Nasmyth was delighted with the appearance of his tool and with the work which it was doing, and on his return to England proceeded to take out patents covering the invention. These were issued in 1848. Although facilities for making forgings of wrought iron of considerable size were now available, the difficulties attending the casting of steel ingots confined their size to small proportions.

The most successful pioneer in overcoming these difficulties was Friedrich Krupp, of Essen, Germany, who has always led all his competitors in the manufacture of crucible-steel forgings.

At the international exhibition in London in 1851 this intrepid manufacturer exhibited a cast-steel ingot

weighing two and one-fourth tons, this being by far the largest steel-casting made up to that time. He progressed rapidly after this, and at the successive world's expositions at Paris in 1855, and London in 1862, and at Paris again in 1867, and in Vienna in 1873, he exhibited ingots weighing respectively ten, twenty, forty, and fifty-two and one-half tons. The latter, made by pouring into one mold the contents of 1,800 crucibles each containing about sixty pounds of molten steel, was an evidence of the great skill attained by this manufacturer in the manipulation both of material and men.

About this time, however, the enlightened governments of the world began to vie with each other in their power of destruction in war by the use of larger guns than could be obtained by the use of cast iron, and of thicker and tougher armament than could be made of wrought iron. This rivalry stimulated inventors to develop methods of manufacturing steel in larger masses and by cheaper processes. Finally the invention, in 1856, by Sir Henry Bessemer, supplemented by the improvements of Robert Mushet, of the pneumatic process of making steel, completed the revolution in steel-making referred to previously. In this process air is forced under considerable pressure through the bottom of a vessel, called the "converter," containing molten cast iron, until all of the carbon and some of the other impurities have been oxydized out. Then just sufficient carbon and other elements are added to make the steel of the composition required.

From this time on it was no longer a difficult matter to obtain large masses of steel, ingots weighing from

five to eight tons being easily produced. Rolling mills, which had been turning out merchant bar and rails made of wrought iron gradually changed their product to Bessemer steel; and an era of commercial enterprise spread its use over two continents. Ten years later, in 1866, Dr. C. W. Siemens, of Germany, invented his regenerative furnace for the melting of pig iron and iron ores either in the raw state or in a more or less reduced condition. About the same time Pierre and Emile Martin, of Sireuil, France, proposed a similar method of melting steel scrap in a bath of pig iron. These two methods were later combined under the name of the "Siemens-Martin" or "open-hearth" process. The hearth of this furnace, being capable of expansion to a capacity upward of fifty tons, allowed a still further development in the size of ingots, the latter becoming practically unlimited from the possibility of combining the contents of several furnaces in one mold. The opportunity afforded by this process of reducing the cost of product by handling large masses of material began rapidly to force its use in place of the Bessemer process, with the probability of its eventually supplanting it altogether.

At this time Friedrich Krupp, of Essen, Germany; Schneider & Co., Le Creusot, France; the Parkhead Iron Works, at Glasgow, Scotland; in England, Sir Joseph Whitworth & Co., at Manchester, and Vickers' Sons & Co., Charles Cammel & Co., John Brown & Co., Sir Henry Bessemer & Co., Thomas Firth & Son, of Sheffield, and Sir William Armstrong & Co., of Newcastle on Tyne, represented the foremost forges of the world.

So far the development of the forging industry in Europe only has been outlined.

In America the working of iron into finished products was practically unknown prior to 1752, for until then England had resolutely forbidden the manufacture of this metal in other than the form of pigs and bars for shipment.

In 1750 Governor George Clinton of New York reported to the board of trade in London, England, "a plating forge" with one tilt-hammer as existing, but not in operation, at Wawayanda, Orange county, in his province and as belonging to one Lawrence Scrawley, a blacksmith.

In 1752 a London company purchased from James Alexander, Lord Stirling, some 23,000 acres of iron-ore property in Orange county, N. Y., and established there a furnace and anchor forge under the name of the Stirling Iron Works. This property in the course of years came into the possession of one Peter Townsend, who conducted the business under the name of Noble Townsend & Co. To these works on February 2, 1776, repaired Colonel Thomas Pickering and General Hughes, representing the revolutionary government, and made contract to be supplied "a chain of iron of the following length and quality, that is, in length 500 yards, each link to be about 2 feet long and 12 inches wide, of the best 'Stirling iron,' 2¼ inches square or as near thereto as possible, with a swivel in every 100 feet, and a clevis in every 1,000 feet," and also to supply twelve tons of anchors. As rapidly as the chain was completed in short sections of ten links each, it was loaded on ox-carts and hauled

to New Windsor, where, at the Brewster forge, under the direction of Captain Thomas Meachim, the sections were united; and the chain was then mounted on logs in sections of 100 feet, floated to West Point, and there united by swivels and laid across the Hudson River to Constitution Island to prevent the passage up the river of the enemies' vessels. Some of the links of this chain are preserved in the museum at West Point.

In 1759 and later small smith forges were reported to have been erected in New England for the purpose of making wrought iron anchors, bar iron, axles, etc. The vast depository of iron in Orange county, N. Y., seems to have been well worked during the early part of the last century. The Queensboro Furnace, which continued in blast until 1812, was well known in its day. The ruins of the "Augusta," established by Solomon Townsend in 1783 in the south part of Monroe, near Rockland county, are still an interesting sight to passers on the Erie Railroad. The bloomery is a stone building seventy feet long, in which were four fires and two hammers. Anchors were made here weighing 6,000 pounds. The "Greenwood," established by Robert and Peter Townsend in 1811, the location of which is now a park, under the name of Arden, and the Southfield Iron Works, established by Peter and William Townsend in 1827, were also prominent. But, compared with iron works in Great Britain and on the continent, these were small affairs, with tilt-hammers run by water-power, and exerted but little influence on the industry of the country. In fact, the industrial condition of the country had not developed sufficiently to cause any considerable demand for forgings. Such

few as were required were made abroad. Large shafts and other machine parts now made of forged iron or steel were then made of cast iron. In 1839, in order to make the shafts for the United States men-of-war "Missouri" and "Mississippi," a seven-ton tilt-hammer was brought from England and erected at the West Point foundry at West Point, N. Y. Under this tool wrought-iron shafts for these vessels, seventeen inches in diameter, were forged successfully.

Later the man in charge of this forge started a similar establishment at Twenty-sixth street and First avenue in New York city, under the name of Tugnot, Dally & Co., and in 1848 and 1849 successfully forged with a seven-ton tilt-hammer wrought-iron shafts seventeen and one-fourth inches in diameter for the vessels of the Collins Line, "Atlantic," "Pacific," "Arctic," and "Baltic," running to Liverpool, England. Shortly afterward the "Bristol" and "Providence," of the Fall River Line, were built, and wrought-iron shafts twenty-three inches in diameter were made for them at this forge. From then on the wrought-iron forging industry developed, confining itself, until recent years, to the larger cities of the Atlantic coast in New England and the middle states. Then the development in maritime interests on the Great Lakes brought about the erection of several large and successful wrought-iron forges in their vicinity. These were supplied with tilt-hammers operated by steam, and also with steam-hammers of modern design of small size. In 1865 the Bessemer process of making steel was first introduced into this country by Alexander Lyman Holly, at Wyandotte, near Detroit,

Mich., and at the North Chicago Rolling Mill, Chicago, Ill., and within the next ten years most of the large rolling mills of the country changed their product from iron to steel.

In 1868 Cooper, Hewitt & Co. constructed the first Siemens-Martin open-hearth furnace in America at their rolling mill at Trenton, N. J. This latter was operated only for a short time, as it was found that its product could not compete with that of the Bessemer converter. This general displacement of wrought iron by steel was naturally felt in the forging industry, and the forges should at once have equipped themselves as the rolling mills had for working the new material, but as forges equipped to make wrought-iron forgings were unable satisfactorily to produce steel-forgings for reasons which became apparent after even a cursory study of the subject special forges were erected for the purpose. The Midvale Steel Co., at Nicetown, a suburb of Philadelphia, originally established in 1858 as a crucible steel plant for making tires, was converted into an open-hearth steel plant in 1874, and took up the forging of tires, axles, guns, and miscellaneous forgings, and was the pioneer in this country in the manufacture of high-grade forgings. A steam-hammer of forty net tons falling weight and of special design in recent years has done excellent work in turning out large forgings of high character.

In 1883 the United States government awakened to a realization of the totally unprotected condition of its coasts and the inefficiency of its navy. When the annual appropriation bill was passed, Congress author-

ized the president to select from the army and navy six officers to constitute a board for the purpose of examining and reporting to Congress which of the navy yards or arsenals owned by the government had the best location and was best adapted for the establishment of a government foundry, or what other location, if any, should be selected for the erection of a plant for the manufacture of heavy ordnance adapted to modern warfare for the use of the army and navy of the United States.

This board before concluding its investigations went abroad and visited the representative gun factories in Great Britain and on the continent. Its report showed to the officials of the Army and Navy Departments that this country possessed an almost absolute lack of manufacturing facilities capable of producing the necessary equipment. Fortunately the secretary of the commission, Captain William H. Jaques, was able to obtain a proposition from Sir Joseph Whitworth & Co., Limited, of Manchester, England, to duplicate in the United States his forging plant for the manufacture of ordnance and miscellaneous forgings. Wonderful developments had been made in forging appliances by Sir Joseph Whitworth, especially through his hydraulic forging-presses, which he used altogether in place of the steam-hammer. This proposition was brought to the attention of the Bethlehem Iron Co.,[1] of South Bethlehem, Pa., through their superintendent, John Fritz. The opportunity of being the first in the field with a forging plant of most approved design and with a large amount

[1] Now the Bethlehem Steel Co.

of work practically guaranteed was too good a one to be lost, and arrangements were at once entered into to consummate a contract.

Meanwhile similar negotiations were opened with Schneider et cie., of Le Creusot, France, to duplicate their armor-plate plant, which was considered the most complete of its kind in the world. These negotiations terminated successfully, and a contract was made with this company enabling the Bethlehem Iron Co. to produce armor plate equal to any made at that time for the navies of Europe.

The money value of these contracts was very great, and has rarely, if ever, been exceeded by that of single orders given by a private firm at any one time. The capacity of such a plant was not, however, deemed sufficient to satisfy the demand which it was anticipated would be made upon it by the immediate requirements of this country. Consequently, instead of carrying out the project as originally projected, it was determined at the same time largely to increase the capacity of the principal tools contained in each of these plants, so that when the work was completed the new forge was easily the largest in the world. For instance, whereas at the works of the Whitworth Co. the largest press had a capacity of 5,000 tons, at Bethlehem a 7,000-ton press was built. At Creusot the largest hammer had 100 tons' falling weight, and at Bethlehem the hammer was built with a hammer-head weighing 125 tons. Since that time additional equipment has been added as necessity demanded, until it is at the present time by far the most complete forge in existence, and, owing to enterprise characteristic of

Americans, competes successfully with foreign forges in the manufacture of armor plate, guns, and miscellaneous forgings.

This having been the most recently built plant of its kind, and having been constructed under circumstances which enable it to be absolutely modern in all particulars, the methods of manufacture there adopted are considered at the present time to be the most approved and as representative of the best practice.

THE COMMERCIAL VALUE OF ADVERTISING.

JOHN LEE MAHIN, PRESIDENT OF THE MAHIN ADVERTISING CO.

This is an age of advertising. Within the memory of older men the ambitious youth was urged to enter the church, the army, the law, or the sciences. To engage in trade was to lower social tone. Now business is generally recognized as a world-dominating science. It is becoming more intricate and complex, requiring the highest grade of intelligence.

Commerce in its elemental form is little more than the hewing of wood, the carrying of water, and trading in the simple things necessary to sustain a low order of physical life. It is only when it advances to grappling with the great wheat crop of the Northwest, the vast yield of cotton of the South, and the products of many mines and factories, that it begins to demand and give substantial rewards for the highest grade of brain power to organize equipment, devise ways and means, and to execute.

War in its crude state has nothing relating to it that appeals to the admiration of mankind. When it means butchery, it is hideous. It is only tolerable when it is the expression of the undivided will of a nation. It is grand when it is the determined and reverent resistance to tyranny by an outraged people battling for liberty. The skill of the master-mind in

war is shown in the incarnation of the national spirit and the expression of its purpose in the rapid and masterly handling of large bodies of troops. Alexander, Cæsar, Napoleon, and Grant possessed more than physical powers. They had the rare quality of securing and maintaining the confidence of the nation and the army. They shifted their soldiers as the expert chess-player moves his mimic warriors, and they won and possess the admiration of mankind because their achievements gave them clear and undisputed title.

So, too, with the master-minds that are now performing the great industrial achievements in commerce. The problems of production and distribution, the elimination of waste and famine, the gathering together of the products of the world and setting them in order for the easy access of mankind, present abundant opportunity for the highest quality of brains. Commerce in gathering and distributing, satisfied with ordinary profit and passively awaiting the result of the capricious tastes of mankind, still leaves much to be desired by the mind that has real creative power.

Commerce in its higher altitudes is shown when, after gathering the products of industry, it goes farther in changing their form and character into other articles specially suited for the higher needs of men and women. Then, by every possible means stirring interest, creating desire, educating appetite, and developing new wants, it makes a stable market for the newly created and more complex commercial products. In this way the standard of living has generally been raised to include as necessities articles the need of

which was unknown to the grandparents of the present generation.

In doing this, commerce requires the wonderful new power which the mere trader never possessed. That power, with its skill, thought, resources, and judgment, virile energy, largeness of mental growth and equipment, combined with a creative force that accomplishes things, is called advertising. I have previously defined advertising as

> influencing the minds of people. It is making others think as you desire. It means utilizing all those forces which produce impressions and crystallize opinions. It is the creating of prestige—that quality which causes others to accept a statement without question.

The merchant who, through his idea of what will please the popular taste, makes his calculations, giving orders to manufacturers for six months to a year in advance, requires great foresight and intimate knowledge of the fickleness of taste. Yet he does not possess the positive force that advertising, when studied and skilfully employed, will give him in his business. He only deals with conditions as he finds them. There is no effort to create conditions, but simply a shrewd adaptation to existing circumstances.

Advertising rests on the supremacy of commerce. It requires stable business conditions for its existence and development. It is, therefore, a higher form of mental activity than the successful exercise of ordinary commercial transactions, because it goes farther, in demanding not only the power successfully to cope with commercial problems, but an added ability to influence the human mind. Advertising will produce active desire where none, or at least only that of a

latent kind, existed before. Advertising, by employing the powerful mental forces which psychologists call suggestion, can create well-defined habits among the people which an alert commercial mind will utilize to build up and foster a business.

A thoroughly equipped advertising man must, then, know something of the fundamental conditions which underlie commerce. For instance, credit, being an essential feature of commerce, rests upon absolute integrity and a rigid adherence to well-defined principles. Advertising also without the fundamental principles which are necessary to commerce is no more advertising than is love the mawkish sentiment which some novels depict, the love which founds and maintains homes where the wife and mother are cherished objects.

There are people who call the displaying of words in newspapers advertising. Such individuals would be apt to consider the clerk who mechanically hands out a cake of soap to a customer, a merchant.

Advertising is not the spending of money in magazine, newspaper, street-car, or outdoor space, but the accomplishment of a definite purpose, which is the influencing of human minds and actions. The many complex conditions which enter into the practical execution of plans for advertising can be only briefly discussed within our time limit. Two sharp distinctions, however, appear when we attempt to consider as to whether an article may be profitably advertised or not.

Raw materials, which are purchased in large quantities and enter into the manufacture of other articles

in which the identity and knowledge of the source of supply of the component parts are lost, cannot be advertised at the large expense which successfully attends articles of small retail value sold in packages and capable of being used in almost every family.

Raw materials are purchased usually by expert buyers, who usually weigh, measure, and consider after themselves carefully exploring the markets. All that advertising at its best can do here is to show how goods offered for sale can be utilized by the purchaser to his profit, and thereby increase the demand for a certain article, or by constantly showing the superior qualities of the goods offered secure a preference at the same price over competing goods or a slight increase in profit. As in selling such goods the number of possible customers is known and usually easily accessible to a salesman, it is my firm conviction that the salesman, when he embodies knowledge, loyalty, and character, is himself the best form of advertising where his services are available.

There are, however, salesmen and people who are called salesmen. A man directing a large business in which certain principles are rigidly maintained should see to it that his customers feel the value of these principles. Hence, some form of concerted, regular, definite communication in the form of printed matter between the moving spirit of the organization and the customers is always to be recommended.

It is for promoting the wider sale of such articles as iron, wheat, corn, raw cotton, and lumber, which cannot be advertised like soap, breakfast foods, flour, and brands of clothing and house furnishings, that the

establishment of the Department of Commerce by the United States government should be earnestly urged. The man who presides over this department should be a deep student of advertising and trained in the practical expression of advertising principles. The census reports today are invaluable aids to the general advertiser, and the more extensively the gathering of accurate data can be done by the government, the better it is for commerce and its higher form of activity, which is advertising.

It is in exploiting and selling articles of everyday use to the average family that modern methods of advertising have reached the highest development. An able statistician claims that of the 13,000,000 families in the United States but 5 per cent. have incomes exceeding $3,000 a year, counting both the proceeds of invested capital and the earnings of the entire family. When thought is given to the number of articles that can be bought only by families having an income of $3,000, and we remember that only 5 per cent. of the population represents possible purchasers, the problem of the advertiser is so to spend the money that he has appropriated that he will reach as nearly as possible only the class to which his goods will appeal. In such a case a magazine of national circulation might have less waste circulation than a local paper reaching the masses. The statistician we have referred to claims that over one-third of all the American families live on less than $400 a year and that over one-half live on less than $600 annually. Thus it is plain that an article which sells just as freely in the family of small means as in that of larger

runs less danger of being exploited in publications where there would be waste. It may also explain why the largest successes in advertising are in those things of small retail value which are in reach of the masses. Desire may be created for the ownership of an automobile in the mind of a man with a family of six children who has less than $600 annually to live on, but that desire is not likely to make the advertising spent to create it in his mind very profitable to the advertiser. On the other hand, a shoe-shining outfit might bring good returns in a publication read by people of small incomes, which would most likely result in absolute failure if offered to the readers of magazines like *Harper's* and *Century*.

With 22,000 publications in the United States, and many thousands of street cars, billboards, and dead walls constantly offered to the man who has money to spend in advertising, there is ample opportunity for choice and discrimination.

As many well-dressed, persuasive gentlemen are abroad in the land who are very industrious in proclaiming the virtues of the special advertising mediums they represent, it looks as if some training for the purchasing of space would be desirable, if efficient results were to follow.

Advertising is too frequently viewed superficially. Very few men who are known as advertising men have ever gone deeper than to note certain phenomena and blindly assert that history will repeat itself. An analysis of cause and effect, conditions and the character of the forces engaged in changing them, is seldom attempted. These men are gamblers in every

sense of the word, and they speak of advertising effort as "playing the game."

Very few publishers understand the value of the advertising space that they produce. It is pitiful to see the ignorance shown on this subject. Too many fail to see the professional side of the subject, and they view the space as merchandise to be sold to whomsoever comes at whatever price the market will permit. Some advance so far as to say they will make a fixed price in order to produce stability of value and let the matter rest there. A very few study out the possibilities of service that they are able to render others, and by systematic effort develop and maintain an advertising constituency so harmonious to the policy of the publication that the advertisements become of great value to the readers because they are adapted to their tastes, requirements, and conditions. Advertising is not material substance. It is service. To be sure, space is sold in magazines, newspapers, street cars, and on billboards, but the true advertiser and advertising man never forget that the space is subservient to the service to be rendered. Ideas are paramount. The purpose of the effort should be clear and definite, and kept constantly in mind during the planning and execution of the details by which it is to be realized. Space, type, words, and pictures are only tools the master-workman uses to express an idea. The finished result of the expert work of the advertiser is not a material substance which can be seen with eyes or touched with hands, but a definite, positive impression on many human minds which is shown by the voluntary purchase of goods the advertiser

wants to sell. The mastery of mind over mind is the real test of greatness. The power of Alexander, Julius Cæsar, Washington, and Napoleon was not physical. It was the rare quality of causing others to think as they desired. No man ever succeeded as an advertiser that did not possess this faculty. No man was ever a success in anything without a fair degree of it. The field for good men in advertising is wide. There is little danger of it being overdone. There is room at the top.

We read that Benjamin Franklin's prospective mother-in-law objected to him on the ground that he was engaged in a business already overdone. He had just started to publish a newspaper when there were three others established in this country.

The last issue of the *American Newspaper Directory* shows 21,844 publications regularly issued in the United States.

Reading matter is certainly mental food. It affects the mind only except as some of it occasionally contributes to starting the kitchen fire. There may be much that is unwholesome and ill-seasoned in what the printing press lays before us, but it is intended for mind utilization only. The development of advertising is closely interwoven with the expansion of the printing business. The large daily papers have typesetting machines and perfecting presses which are expressions of the fierce desire for speed. The great magazines and the magnificently illustrated catalogues have been evolved on the line of more delicate effects in typographic impression and more minute and artistic detail in illustrative reproduction.

Color work has made wonderful progress, and scientific men are already beginning to explain why colors in certain combinations seem to have greater powers of attraction than others.

Right here it might be wise to say that advertising does not consist in merely attracting attention. A man could go to his business with a dress suit and a red necktie. He would sacrifice the potent force of dignity. A bull fight on the campus of this university, if authorized and conducted by President Harper, would give him and this great institution more free publicity all over the world than any great scientific discovery that could be announced.

Advertising must secure attention, but it must come from the right kind of people and in a way that produces respect for the article advertised. Hence, all possible knowledge of the human mind, its mysterious and subtle manifestations, and the influence of affirmation, argument, color, suggestion, or an appeal to the imagination, must enter into the deliberations of the mind that plans and executes an advertising campaign.

Let us imagine for an instant that a man had never shaved himself or knew that such a thing could be done. After seeing a razor skilfully manipulated, suppose he should try it on himself with one of those so-called knives his wife keeps in the kitchen? Would he be competent to say that his face was different and that shaving was not adapted to his peculiar condition?

These illustrations are no more overdrawn than the notions some people have about advertising. This, of course, is due to a lack of accurate observation and

anaylsis of the fundamental principles on which its operations are conducted.

Notwithstanding the wide prevalence of mistaken ideas about advertising and its true functions, the money spent amounts to millions annually, and much of it is spent with intelligence and great effectiveness, though I believe much the larger portion is wasted in a desultory manner along lines that even a gambler would despise for their lack of justification.

The men who have made a success of advertising have not looked at it as a matter of luck. They have believed its great powers were subject to immutable laws and have sought to become familiar with them. Illustrations, words, and space, and the cost of the same, while carefully weighed and considered, have been subordinated to the main purpose of producing a mental impression. I can imagine Millet, the painter of "The Angelus," testing colors and canvas, and demanding only the best the market could afford regardless of price, but never asking the dealers in artists' materials to submit bids. The best service and the best articles cannot be secured by asking for competitive offers in price.

The place of advertising in modern business is secure. It occupies the most important position, notwithstanding its true functions are so largely misunderstood. The merchant princes, the monarchs of manufacturing, and the generals of distribution have found advertising absolutely essential to the upbuilding and conduct of their enterprises.

One very interesting fact is the clear distinction between the effect of advertising on the final purchaser

or consumer and the intermediate handler of the product. The man who buys a hat to wear himself is in a radically different position from the man who buys it to sell again.

The latter is the dealer, and, strange as it may seem, the most common error that manufacturers make is in regarding the dealer as a consumer. The dealer buys a hat to make a profit in selling it again. Two considerations appeal to him—price and a quality for which he can establish a permanent trade. Style is valuable to the dealer only as it is valued by the man who buys from him. Shape, color, trimmings are not in any sense a matter of the dealer's individual tastes, if his customers—the consumers—have well-defined ideas on these subjects themselves. The considerations which cause the purchase of a hat by the man who wears it spring from radically different motives. He may think he buys a hat because he has to do it. The habit of hat-buying is evidence of some form of skilful advertising years ago. A really independent man would wear a hood or a scarf, or let his hair grow and wear nothing, if he were not a slave to other men's ideas in putting on and wearing what others have thought out to be best for him, and incidentally, perhaps, best for them, because they were in a better position to supply the demand they thus created. To be sure, a buyer may exercise some selection in color, shape, and style, but his selection is usually confined to what is placed before him. He may buy a broad-brimmed soft hat because he admires a certain presidential candidate; he may buy a hat to please a woman; he may pick one to minister to his own vanity. At any rate, his selection depends upon something which another has unconsciously forced on his mind, and it is in the study, comprehension, and utilization of those things which cause such impressions that the manufacturer of a hat should concern himself as soon as he has mastered the mechanical problems of his factory.

Advertising thus gives a manufacturer the power to produce trade for the thing he is best equipped to produce. It eliminates competition. It creates, forces, builds. It makes things happen. Advertising is so many-sided in its character that it deserves attention in connection with every department of a business organization. As already stated, it will produce desire; gratified desire produces habit, and habit produces business. But advertising does more than this. It makes sales. Not in the same sense as the salesman, for the brainy salesman is only given larger fields for usefulness and greater emoluments for his efforts when he co-operates with advertising. But advertising produces a demand for an article which the dealer is compelled to notice and which he supplies as he does sugar, coffee, cotton, cloth, or any other staple.

In making articles sell as the result of a demand created by the advertiser's efforts, advertising eliminates competition to a large degree, increases profits, makes the good-will or intangible quality of a business or brand name largely enhanced in value. In this way advertising produces value, and many instances could be cited proving that the intelligent expenditure of money in advertising was an investment as much as the investment of more capital in tangible things

like buildings and machinery. Take the Royal Baking Powder Co. The capital of this concern, to a large degree, is represented by its good-will and the prestige due to the exclusive right to use the name "Royal" in making baking powder. Take "Gold Dust Washing Powder" as an example. If everything in shape of factory, raw material, and everything else which would be called tangible property were swept away, the right to make and sell Gold Dust Washing Powder would represent a very large sum. In this way money spent in advertising is invested just as much as if put into buildings, live stock, or produce, which need constant repair and attention to keep them in proper condition and their value from deteriorating.

There are several other points where advertising comes in to save expense. A man who does his business on the basis of advertising can employ less capital and thereby save on his interest charges. This is because business based on advertising is produced more by the creating of business conditions than by adapting one's affairs to the same. Collections can be made closer and much less capital used, because the very nature of the business puts the purchaser in the position of having sought the goods when he has read and been influenced by the advertising.

Great retailers have found that advertising will bring purchasers to their stores earlier in the day than they would otherwise come. Rent, clerk hire, insurance, and all the other fixed expenses of a business must be met before there are any profits. If a store is rushed with customers from 11 A.M. to 5 P.M., there are really only six hours to do business. As advertising of bargains and special sales will bring in customers two and sometimes three hours earlier, the fixed expenses for those hours are not increased. In this way advertising saves rent, clerk hire, insurance, and reduces the fixed expenses, to say nothing of giving the master-mind who pilots the big modern department store through the seas of business a close insight into the tastes, habits, and desires of the people.

Advertising also has an educational value which enables the seller of merchandise to convince people what they want to buy before they come to the store. In this way sales are greatly facilitated. One clerk is able to wait on more customers, and the ratio of expense is thus lowered.

There are many great stores which have acquired the confidence of large numbers of people in their newspaper announcements. In this way the tastes of these regular customers are molded to a considerable degree, and the buyers for this store are enabled to secure lower prices by placing larger orders, as they have the assurance that the advertising of the house will be able to create a demand for the large purchases they have made.

A shrewd advertising man in a large retail store is able in time to divide the customers of the house into several classes and influence all of them by advertising.

A certain number want high class and exclusiveness. They are won and held by a studied catering to their wishes. Another class will spend its surplus cash for bargains, no matter what kind they are. These are known and the best method of reaching them tested, and the house is thus able to overcome errors of a too

sanguine buyer and to take advantage of a manufacturer's misfortune.

A shrewd advertiser at Christmas time can influence the people who want quality to spend more money by suggestive advertising. Many a man who has decided to spend ten dollars on his wife's present has been influenced to spend twenty-five, after having it impressed on his mind that about that amount was necessary to get those things which he knew a nice little woman really wanted. A man who regards a piece of jewelry as a luxury and an extravagance reads a suggestive advertisement and buys an expensive ring as an expression of sentiment which would be cherished for the sake of the sentiment, and thus by its constant suggestions keep alive and honor a reciprocal feeling.

Consideration of the media used by the American advertiser can only be given in a general way. The great family journals of national circulation, like the *Ladies' Home Journal, Delineator,* and *Youths' Companion,* are practically home publications. They deal in a practical manner with those problems which come up constantly in the average home. They go a long way toward answering the ever-recurrent problems: What shall I eat? What shall I wear? How shall I furnish my home? How shall I raise my children? They mold thought. They create habit. These three publications are also worthy of particular attention in the manner in which their advertising columns are handled. No advertisements of liquors, tobacco, or things of a questionable nature are admitted to their columns. The *Youths' Companion* does not draw the

line quite so closely as the *Ladies' Home Journal* and *Delineator* on proprietary remedies, but the exceptions are very few and confined to old-time family preparations. The *Ladies' Home Journal* and *Delineator* refuse all medical, remedial, or curative announcements, and also all advertisements of investments. All these publications insist on knowing what the advertiser offers to their readers, and if he is, as far as can be learned, fully able to carry out his offers made in his advertising. In the event of complaint of unfair dealing being made by any subscriber, the matter is promptly investigated, and if the advertiser is in the wrong he is denied further use of the columns. All three publications have circulations exceeding half a million copies. One inch space for one issue costs $84 in the *Ladies' Home Journal,* $42 in the *Delineator,* and $56 in the *Youths' Companion.* Even at these prices, which seem extravagant to the uninitiated, it only costs one cent to place this one-inch advertisement in these three publications in the homes of 112 families, and, as it is well known that these publications are read by at least five persons to each copy, 560 readers are reached with each one-inch advertisement at the cost of one cent. Comparison of cost with circularizing or personal soliciting is significant and instructive. I might say that I have known one Chicago advertiser to receive over 1,000 letters in one day from an inch advertisement in one of these publications.

At this point I should like to emphasize the statement that because the *Ladies' Home Journal* and *Delineator* refuse both proprietary remedies and invest-

ment advertising, this action is not a reflection on either proprietary medicines or investments as a business. The explanation given by the advertising managers of these publications, and other publishers who refuse certain classes of advertising, is that it is done in order to keep their columns filled with announcements that contribute to holding the interest of subscribers.

That advertisements have this power is shown by the generally admitted fact that the loss of the full-page Wanamaker announcement by a certain Philadelphia newspaper not long ago resulted in a dropping off of about 20,000 daily circulation. Proprietary medicines are better adapted for exploitation in daily papers and media that reach the masses. There is just as much difference in the quality of proprietary medicine advertisements as in those of investments. There are some publications who refuse both on the ground that they have not the time to make the constant discrimination necessary. There are others who accept everything that comes along, and hence their columns are shunned by the better class of proprietary medicine and investment advertisers. The best method for a publisher to pursue—and the one which is most generally adopted by those whose service is suitable for either investments or proprietary medicines—is to discriminate. The integrity, business ability, and commercial honor of many of the men engaged in the medicine business is fully as high as that of the men who make the words "banker" and "broker" honorable in all of the trustworthiness that is attached to the same.

The fact that men who want to fleece their fellow-men call themselves bankers and brokers is really, on second thought, only a compliment to the business. That other men seek to impose on their fellow-men by offering them remedies that are worse than useless is proof of the efficiency of engaging in the business of selling curative remedies.

The men who sell investments and proprietary medicines with honor are those who are faithful to the trust that the public places in their hands, and, while it is necessary for men in both of these lines to establish their integrity and efficiency at a very great cost of energy, time, and effort, the reward that comes to them when once the goal of success is reached is such as to justify the attempt on the part of the most courageous and able spirits.

The great magazines like *Harper's, Century, Scribner's, World's Work, Review of Reviews, Munsey's,* and *McClure's* possess peculiar influence. They are read by people who expect to find in their pages new lines of thought and the records of the world's achievement in art and literature. The money spent in the preparation of the art and literary matter in these magazines is enormous, but it is exceeded largely by that spent for the same kind of talent in preparing the advertising pages. The life of the magazine is long and its advertising pages have far-reaching influence.

The weeklies lie midway between the monthly magazine and the daily newspaper. They have some of the deliberative and crystallized character of the monthly, with the actual news feature of the daily.

The weekly is usually specialized into such divisions as agricultural, religious, society, political, and juvenile. The news feature is usually prominent, but it is news of a much more limited scope than the daily. The comments and special articles are generally directed to the particular class to which the news features most strongly appeal.

The daily paper is the record of the day's events. Everything that happens today that can have any human interest to its readers is recorded. Accuracy is sacrificed to speed. Gossip, rumor, opinions, impulse, and sentiment predominate over reflection, analysis, and patient research. The daily paper lives but a day. Where is yesterday's daily? Anything of paramount value finds its way eventually into the specialized weeklies or great magazines, and finally into historical or cyclopædic records. The daily newspaper is as essential to our business and social life as the air we breathe or the food we eat to our physical natures.

The street car has become a powerful factor in advertising. Our most important commercial thoroughfares are those crowded with street cars. The more business, the more street cars. The cards give opportunity for display of color, and attract the eye and impress the mind, and eventually create desire to test the articles advertised.

Painted signboards and billboards, on which posters are placed, have great force. The amount of money invested in billboards, the amount paid out in labor to painters, billposters, and for paint, paper, and paste, amounts to several millions annually. I am not one of those who think the billboard and outdoor sign

are offensive. I am ready to prove that the billposters and sign-painters would refuse to put up many of the advertisements that regularly appear in the columns of the daily papers that find fault with outdoor displays.

If the encouragement of art is worthy, then commend the painted bulletin and the billboard. They give employment to artists, and the demand for better grades of art work is growing among users of posters just as fast as among magazine or newspaper advertisers.

The business of buying and selling space in newspapers, magazines, street cars, posters, and signs has grown to enormous proportions. The men engaged in it, both as buyers and sellers, are remunerated more liberally than I believe the same grade of talent secures in law, medicine, or any of the other professions. The tone of the advertising business is higher than ten years ago. The men of dignity, high character, and wide knowledge are rapidly forging to the front. The most successful sellers of space are those who seek only those advertisers who have a proposition peculiarly adapted to the space to be sold. The best sellers of space refuse to sell where there will be certain dissatisfaction on the part of the buyer. Hence, the advertising salesman, to be really successful, must possess, in addition to selling ability, that of knowing what the buyer can and will do with his purchase. The men who can do this are so scarce that the demand is greater than the supply, and the young man who gives indication of this peculiar ability is so quickly snapped up and so eagerly sought for that he pos-

tively requires the rare quality of balance and ability to bear prosperity to make him permanently successful. Advertising embodies all the pleasures of the chase with the creative delights of seeing ideas materialize. It is an intoxicating business. A clear head, rigid adherence to sound principles, and an ability to see things as they are, and not become led away by the seductions of one's own egotism or the excitement of a gay social life, must be possessed by all who would win and hold the honors so lavishly given to those who succeed in advertising.

The bewildering number of opportunities to spend money in advertising, the very few sellers of space who have discrimination and honesty combined, and the large number who are counterfeits have made the entering into successful advertising about as difficult a thing as can be imagined.

In the first place, publishers themselves know very little about the space they sell and its possible use. The mind which has the burden of purchasing editorial, literary, and reportorial ability, the securing of subscribers, and the mechanical production of a paper has about all that it can carry. The publisher must and usually does delegate his advertising department to another, and what a mess he makes of it sometimes! The blowhard, the man who panders to the lowest order of social instincts, and the brazen bulldozing type are frequently found in positions where the publisher himself is a man of honor and high character. In such cases the publisher has simply failed to awaken to the importance of advertising and its great possibilities if placed in charge of intelligent and clean men.

The advertising agency has evolved with the enormous increase in the advertising business. The agent originally solicited for one or two papers and received his commission direct from the paper. In time he began to get all or a large portion of the contracts placed by a single business house, and his character as a direct representative of the paper changed to that of a quasi-representative of the advertiser. In this way the agent lost exclusive representation of his papers and found others recognized as agents working in the same field. Then ensued a period of cutting of rates and dividing of commissions which made the agent a mere scalper and an object of distrust by both publisher and advertiser.

The business has finally become adjusted by the advertising agency becoming what I have often defined it —

> An organization of men competent to select suitable advertising media, buy space, write advertisements, create ideas for and make illustrations, submit copy to advertiser for approval, then forward same to the publisher, see that same is correctly executed, collect from the advertiser, pay the publisher, and co-operate with the advertiser in conceiving, developing, and perfecting those collateral forms of advertising effort which are necessary to make a campaign fully successful. The advertising agency's services cost the advertiser nothing, as they are paid by the publisher in the commission or lower price which is secured by the agency.

The publishers of the *Ladies' Home Journal, Delineator, Munsey's, McClure's,* and a few other publications, recognize as agents only those who have signed a contract not to rebate any portion of their commission to the advertiser. The tendency of the better publications is toward stability of rates and

recognition of agencies limited to those who are creative in their efforts to produce new advertisers.

The billposters have a very strong association, and since its organization billposting has made wonderful strides. The association does not allow its members to grant commissions to any but authorized solicitors. Any form of advertising space that has not sufficient inherent strength for its owner to maintain a staple price for it has not enough strength to become an advertising factor, and as the unmistakable tendency of all strong owners of space is to recognize the agency with a commission making its service free to the advertiser, the agency's position is becoming more clearly defined and established. The modern advertising agency keeps on file complete information as to the cost of space in practically every publication, street car, and billposting plant in the United States and Canada. Records of previous contracts are kept tabulated for comparison. Personal acquaintance with publishers and owners of space is carefully cultivated, and the highest type of co-operation urged and secured wherever possible. Artists, writers, expert typesetters, printers, and engravers are constantly employed. The best methods and lowest prices for making and shipping plates to the publisher are carefully considered. While the mechanical organization is always subordinated to the professional feature of the business, the equipment is always the best possible to be secured, just as any other professional man surrounds himself with the finest tools of his trade.

There is a popular misconception of the functions of the agent. Many think he should know the technical details of the business he is advertising. Life is too short for him to learn that, and it would be a mistake for him to attempt it. At the same time, a knowledge of nearly everything, even though it be only superficial, can be utilized in advertising better than in most any other line of business. Of what value is the knowledge of the manufacture of a camera to the advertising man? He should know all that the camera will accomplish in the hands of the person who buys it. He should study it wholly from the buyer's point of view, and find as many reasons as possible why it should be bought, and use the most economical and efficient means to arouse the possible buyer's desire to possess it. Knowledge of sales methods and of the established channels of distribution are essential to the advertising agency, and the plan it produces should incorporate suggestions for utilizing the power of the advertising in all these ramifications.

It is in this further development of the advertising idea to reach the consumer that what is known as the "follow-up" system has been evolved. Formerly an advertiser used his advertising space merely to produce publicity. This means that something which makes every person remember there is such a thing as Tobey hand-made furniture, even if you cannot locate in your mind just when and where you saw an advertisement of it. Users of magazine space in time found they could not only secure publicity, but, without in any way depreciating the value of the same, secure in addition direct inquiries from people who are directly interested in the goods advertised. These inquiries made a foundation for a follow-up system, which gen-

erally consists of some form of direct appeal to both the inquirer and the dealer to whom the person making the inquiry is most likely to be known. To illustrate, the manufacturers of the Munsing underwear offered in their magazine advertisements to send a catalogue to all who would write for it. The inquiries coming in were from such a desirable class of people that the sales department was able to interest dealers all over the country when they showed letters from the dealers' own townspeople as an evidence of the efficiency of the advertising. This made it desirable to create more inquiries. So it was decided to offer a doll's undershirt, showing the fabric, to every mother writing in and giving the name of her dealer and the number of children she bought underwear for. This resulted in getting six times as many inquiries from the same publications as before. It does not stand to reason that more people saw or read the announcement, but it is certain that the persons who replied were, in the very act of writing, more deeply and permanently impressed than if they had simply read the first advertisement for many months.

In distributing samples in connection with the use of street-car cards and outdoor display, in offering samples for coupons published in papers, in giving every dealer in advance one or two packages of an article, previous to starting the local newspaper advertising, the follow-up system has been successfully incorporated into advertising work. It is impossible to enumerate the many ramifications of this idea. In several hundred cases that have come under my notice there have not been two alike, and I have seen repeated

attempts at imitation of another's idea result disastrously, because the individual requirements were not carefully studied and covered.

The one thing that should convince the average business man who has not given much time and thought to advertising is that it has commercial value of the highest order; that it really is a higher evolution of commerce and a marked improvement on average commercial conditions, as is evidenced by the growing spirit on the part of owners of advertising space to restrict the use of the same to customers whose business is desirable, and also to censor the text matter and, in some instances, even to tone down the too free use of heavy-faced type, and vary display.

The up-to-date, alert billposter, instead of fighting the restrictions in height, size, and quality of the billboard, is earnestly advocating them. The publisher who knows that the confidence of the readers in his advertising columns is a valuable asset is growing more careful every day as to what those columns contain. The advertising man who realizes the professional quality of his services where he can assist the advertiser to use the same space in the same publications and make from 50 to 500 per cent. more out of them than the advertiser could make for himself, knows that his talent must be guarded and exercised only when sincere conviction and enthusiasm can be brought into requisition. There is a very judicious golden mean between the cold, dissecting spirit of the study or the laboratory and the spectacular appeal to the imagination and the emotions.

Napoleon would have made a grand advertising

man. When sought for to quell a riot raging in the streets of Paris, he was found in his attic, alone and diligently studying the streets of the great city. When confronted with the success of his later campaigns, and realizing the importance of having the masses with him, he carefully calculated the effect of waiting before announcing his victories until he was able to date his dispatch with the name of the palace of his defeated adversary. This intelligent combination of accurate knowledge of the real fundamental and subtle forces with the power to attract and hold the ephemeral popular mind is the wide range of ability that the advertising man who succeeds today must possess.

AT WHOLESALE.

A. C. BARTLETT, VICE-PRESIDENT, HIBBARD, SPENCER, BARTLETT & CO.

The University of Chicago is a wholesale educational establishment with retail departments. Knowledge, packed in gray matter, is collected from all divisions of the globe and here distributed at wholesale to such patrons as teachers, professors, and preachers, who in turn deal it out to pupils, parishioners, and others in quantities to meet individual requirements, and at retail to the young ladies and gentlemen whose acquisitions are for their own personal use or benefit.

To the five senses the material collected and warehoused at the University and shipped to the markets tributary to Chicago (which, in this case, include the entire civilized world) is not so tangible as calico, molasses, and nails, but in some quarters is deemed almost or quite as essential to the welfare and happiness of consumers.

A merchant will contend that no civilized being can exist without the use of merchandise, while quite large numbers of the human family have lived to a ripe old age without being possessed of a diploma from a university or even from a college; hence, the most useful men of society, the real benefactors of the race, are to be found in the mercantile class, and not in the faculties of the institutions of higher education.

However, this paper is not intended as an indorsement of that contention, and the foregoing is simply

preliminary to saying that your president remarked to the writer, in substance: "Our people at the University know how education is dispensed, but many of them, even in the College of Commerce, have little idea of the operations in detail of a wholesale mercantile house, and I wish you would come down and tell them something about it." Following a positive refusal, on the ground that the subject could not be made interesting, came the assurances and convincing arguments which in various forms have proved so convincing to a multitude of people, with the final result which you have before you. To insure the eventual termination of the talk, it has been reduced to writing.

Unfortunately for the general treatment of the subject, the writer knows no business except the one in which he is engaged (and that none too well), viz., the wholesale hardware, and at the outset begs your pardon if he talks more about gimlets and fishhooks than about silks, satins, teas, hats, caps, boots, shoes, or books.

The bases of a successful wholesale business are capital; financial ability; judgment of qualities, both of merchandise and men; a knowledge of present conditions, not only local, but general; a faculty for forecasting future conditions and needs; and last, but not least, a genius for organization. Men who each possess all of these qualifications are as scarce as fit candidates for aldermen. This is an age of specialization in business as well as in profession. When your fathers were lads, the family physician treated all manner of diseases, practiced surgery and dentistry, and not infrequently branched out into the veterinary field. At the present time the M.D. who sharpens your eyesight and improves your hearing hardly knows that you are the possessor of a pair of lungs. The surgeon who saws off your leg may not be on speaking terms with his fellow-practitioner who awakens your torpid liver; while the dentist who fills a decayed tooth sends you to a professional tooth-puller to have a member in a little more decayed state extracted.

In a wholesale house it is not only necessary, but indispensable, that either a partner or officer in the business or a trusted confidential employee shall be a responsible head of each department and of each subdivision of that department. And I want to suggest in parenthesis at this point that you promptly disabuse yourselves of the idea, if such you have, that the opportunity for an energetic but poor young man eventually to rise to the very head of a large mercantile house is not as good as it was a few years ago, for that idea is altogether erroneous. As an experienced merchant, I assure you that it is less difficult today to secure ten pounds of capital than it is one ounce of brains. It does require more capital to inaugurate and conduct a business than it did a half or even a quarter century ago, but it also requires the possession of much greater skill, intelligence, and practical education to successfully manage a business than it did in the olden time. You do not begin the study of language by attempting to read Greek, but by learning the English alphabet (if under the new methods of training the young I err in this statement, you will

kindly correct me), nor do you undertake to demonstrate the binomial theorem until you have mastered the multiplication table. It is only the young man inheriting capital who undertakes to begin his business career at the top. Unless the young capitalist has the good sense to associate with him trained business men, his career is inevitably finished at the bottom. If you have natural qualifications for a mercantile life, make thorough preparation by way of education; get your experience by beginning with the veriest rudiments of practical business, and when you are ready to assume the higher responsibilities, capital will be seeking you rather than you seeking capital.

As I shall confine myself mainly to "the conduct of business," I will not undertake to deal with its founding or its formative period, but will attempt to give you, somewhat in detail, an idea of the machinery and its operation when the business is in full swing.

In my youthful days I had a vague idea that a wholesale business, when fairly started, ran itself; that it was a sort of clearing-house for the manufacturer and a storehouse for the retailer, from which the latter drew his supplies as needed, the jobber having little to do but to receive, display, and ship the goods, collect the money from his customers, remit a portion of it to the manufacturers, and grow rich. I learned from experience (gathered largely at the expense of my employers) that I had not, as a lad, fully comprehended the entire situation. The qualifications and intellectual requirements of a successful wholesale merchant may perhaps be most easily understood by allotting them all to a single individual, and afterward naming the divisions which are ordinarily made in a business house.

A merchant such as we are discussing must first be a financier, one who with a limited capital can conduct the largest business which his means will permit and always keep his credit at the highest point. By capital is meant cash investment and not certificates of stock; and the word "limited" is used in a restrictive sense. Unlimited capital is, as a rule, an unhealthy element of business. The merchant's inclination to purchase merchandise must be held within bounds by a careful calculation of ability to meet bills when due. In making sales, he must guard against the importunities of customers and the pressure of competition, which tempt him to grant too long time or too large credit. The shadow of a coming pay-day hangs over every transaction.

As a buyer of merchandise, he must be governed in his purchases, not by the styles and qualities which manufacturers produce for the country at large, but by his own personal judgment as to the wants of his own particular customers. The old adage, "Goods well bought are half sold," is as true as when it was first promulgated. A buyer must not only be a judge of values, but must have judgment approaching intuition as to what will sell, and must have experience to determine what sizes, weights, dimensions, etc., to select. There is nothing more disheartening to a merchant, or more destructive to his profits, than the marketing of large quantities of unsalable goods at one-half their purchase price. This buyer must have a carefully studied idea of future necessities and

demands. Manufacturers, generally speaking, do not carry stock, the bulk of their product being manufactured to fill specific orders. The purchases of wholesale clothing merchants for their next summer's stocks were made months ago, and the goods are now being manufactured. The requisitions upon foreign and even domestic makers of summer dress goods have gone to their destination. The brands of the tea you will sip at next winter's afternoon functions have already been determined by the orders sent to the Orient. The tools which will be used in the harvesting of the coming season's crops in all this Northwest were bought by the wholesale merchant last November. A successful buyer must have judgment bordering on genius to determine what new styles and new inventions will prove salable and will do credit to the house which distributes them. The best profits being made upon the new articles before competition or commonness has cheapened them, the temptation is to be a pioneer on a large scale. When, for some unforeseen cause, the public fails to co-operate, or, having purchased, discovers a lack of utility, the outcome and echo of the transaction seems to the buyer to extend to the ends of the world and throughout all time.

He must give such instructions to manufacturers regarding the division of shipments as will insure an ability to store a full stock at the time needed, and a certainty of financial ability to meet the bills. Not only must he give the instructions, but must be satisfied that the manufacturer can obey them; otherwise, when the demands from his customers materialize, he will be unable to meet them.

A successful merchant is one who grants credit with a liberality which insures the loyalty of his customers, and with a conservatism which guards against losses. To be a judge of credits means to be a judge, not only of what constitutes a good risk based upon assets and liabilities, but of human nature as well. A combination of small capital, good character and habits (business and otherwise), thrift, and industry is a much better groundwork for a line of credit to a customer than is large capital, indifferent character and habits, and loose, unbusinesslike methods. It goes without saying that adequate capital, unimpeachable integrity, and strict business methods constitute the ideal risk.

The successful merchant must possess the varied qualifications of salesmanship. To be a good salesman is not only in itself a trade, but an accomplishment. A first-class salesman must not only know his goods and their values, but must be equally well informed regarding the lines with which he will come in competition. He must be able to win and retain the confidence of the men with whom he transacts business. In making sales, he must consider the interests of both the buyer and the seller. He must know that a sale which overstocks a customer or gives him ground for feeling that he has been unintentionally overcharged, or in any manner defrauded, is the most unprofitable sale that can possibly be made. An ideal salesman is not one who depends upon what is vulgarly known as "a gift for gab." One of the best salesmen I ever knew was the most quiet and least obtrusive in his manner. A thoroughly equipped

salesman must have confidence in the merchandise he is selling, and be able to exert personal magnetism. A man who never makes friends never makes customers.

A successful merchant must be capable of so organizing the working of his business machinery as to secure the most prompt and accurate transactions with the least unnecessary expenditure or waste of energy or money. In these days of general expansion and quick action, the merchant who has not his business thoroughly organized, and has not adopted the latest up-to-date methods, must withdraw from the procession or submit to being run over. Time is becoming the essence of a business transaction. As an illustration, the Chicago and North-Western Railroad Company loads by six o'clock in the evening all the merchandise received at its depots up to five o'clock of the same day and distributes it at the various stations in eastern Iowa the following morning. A retail merchant at Cedar Rapids before leaving his office Monday evening orders by mail a bill of goods from a wholesale house in Chicago. The order reaches its destination Tuesday morning, and if the Cedar Rapids man, upon arriving at his place of business Wednesday morning, does not find his clerks unpacking the goods, he concludes that his Chicago correspondent is a back number. If during the next twenty-five years business continues to be accelerated in the same ratio in which it has been moving during the past twenty-five, an Omaha merchant will send his order to Chicago by telephone, and if the goods do not arrive as an echo to the order, he

will think something has gone wrong in the mercantile world.

As it would be nearly as impossible to find a perfect human being as one who embodies in a degree approaching perfection all the qualifications named for a successful merchant, the duties attaching to his vocation are divided among different heads of departments of financing, buying, crediting, selling, managing, etc., each of whom is supposed to possess the requisite qualifications for his particular branch of the business.

Having at least attempted to show you the skeleton upon which a wholesale business is constructed, I will undertake, in a hasty and somewhat superficial way, to outline some of the details of the daily routine.

An order, whether secured by the personal solicitation of a salesman upon the road, purchased by the retail merchant in the sample room, or transmitted voluntarily by mail, after reaching the counting-room takes the same general course. First it goes to clerks, by whom the amount, in dollars, of the order is estimated for the purpose of enabling the Credit Department to judge of the responsibility of the customer for that particular bill of goods. The order then goes to the bookkeepers, whose ledgers represent the various states in the territory from which the house draws its trade. Each account on the ledger has at its head certain cabalistic signs, placed there under the instructions of the Credit Department, which tell the bookkeeper the extent of credit to which the customer is entitled, the time allowed for payment, etc., etc. If the conditions indicated have been ful-

filled, the order is initialed and goes directly to the Order Department. If the conditions have not been fulfilled—if the party has bought beyond his limit, has failed to pay his bills promptly, or if otherwise out of line—the order goes to the Credit Department for consideration and special treatment. It may be passed or may be rejected, the final disposition being dependent, in part, upon new information regarding the customer himself, or the crop prospects, or other temporary or local conditions; and in part upon the momentary state of the credit man's liver or digestive organs. A large financial house in this city requires a physician's certificate before engaging a man who will at once or may at some future time occupy a responsible position. The information upon which a credit man bases his judgment is drawn from personal interview with customers, investigations made by the traveling salesmen, letters of bankers and other references, reports of commercial agencies, and, best of all, detailed statements made upon prescribed forms by the customer himself over his own signature.

An order, having passed the ordeal of a bookkeeper's set rules and a credit man's judgment, goes to the Order Department, is put into perfectly intelligible shape as relates to the numbers, qualities, etc., of the goods to be shipped (the items not in stock and to be bought are copied into the city buyer's book), and then is placed in a spring-back book (each containing but the single order), the cover to which indicates its exact rights in the procession of orders awaiting execution. For example, a red-covered book containing an order which should be filled with the utmost dis-

patch takes precedence over books of any other color in the selection of goods, their being called back, packed, and invoiced. The blue books would follow the exhaustion of the red pile, and would in turn be followed by green; etc., etc.

Order clerks with rolling baskets or trucks select the goods in the various departments, after which the merchandise is assembled in the packing-room, called back by men who were not parties to its selection, packed, and, from instructions given upon the various slips and tags accumulated during the execution of the order, is shipped by the Shipping Department. After the order is "called back," the book goes to the pricers for pricing, to the examiners for the examination of these prices, and to the invoice clerks for invoicing. The invoice is sent to the journal clerk for journalizing, and thence to the Mailing Department for folding, inclosing, and stamping. Later on, the original order is checked against the journal entry to show that there have been no errors in entering or no invoices unwittingly mailed without first having been journalized. From this point, it is a matter of bookkeeping until the statements of account reach the collector.

I have endeavored, in a few words, cutting many corners, to give you an idea of a single department—that of order-filling. It would be wearisome and unprofitable to you if I should go in detail through the Financing, Cashier's, Buying, Credit, Collection, Traveling Salesmen's, Receiving, Shipping, and the numerous other departments, each of which has its system and its definite part of the work to perform.

Even the head of the Stationery Department of a large mercantile house has more duties and greater responsibility than falls to the lot of the proprietor of a small retail establishment. The wheels and even the most unimportant cogs on the wheels of this complicated machinery must be carefully adjusted or the product will be worthless. The successful merchant is not the man who is looking for some amusement or outside employment with which to kill time.

The young man, whether graduate of a high school, college, or university, who wishes to learn a mercantile business usually finds himself at seven o'clock on the first morning of his business career taking off his coat and putting on his overalls in front of an order clerk's locker. At some future time there may be discovered a process by which the theories gained in the schools may be put in practice in mercantile life without the necessity for actual contact with merchandise on the part of their possessors, but it will be when experience has ceased to be a teacher; when observation will be the conservator of all knowledge. The best mechanical engineer is the man who has hung his diploma from a school of engineering in his room, and gone down into the machine shop and handled steel and iron without gloves. A man, to be a successful merchant, must at some time master theory, and the best time and place for this mastery is during his younger days and in the schools.

Occasionally a man who has received only a rudimentary education becomes a brilliant and effective preacher. Here and there a man whose school education was confined to his acquirements in the grammar

grades makes his way to the very front rank of the legal fraternity. At infrequent intervals, a man who has been obliged to forego the advantage of a liberal education has evinced a genius in diagnosis and therapeutics which has placed him near the head of the medical profession. And so there are men who seem instinctively to be merchants and whose theories are evolved inductively from practice, without the labor incident to acquirement through study.

Because there is, exceptionally, a preacher, lawyer, or doctor who has risen to eminence despite his lack of book training, you would not advocate the cutting of higher education by men seeking the professions. Neither should you advise a young man who is headed toward a commercial life to accept less education and mental discipline from the schools than the utmost which is essential to the highest achievement.

If a man is content to be always a country schoolhouse preacher, or a pettifogger in a village justice court, or an herb doctor on the frontier of civilization, there is no use in wasting good book learning on him or in taking the time of educators in attempting to stimulate his brain into activity.

If a man is content to spend his life as the proprietor of a crossroads store, sitting on a nail keg, chewing tobacco, and exchanging stories with his lounging customers, he is fully equipped educationally and theoretically when he has partially mastered the three R's.

What we are considering today is "At Wholesale," and the preparation must be commensurate with the position and results to be attained. Were I to recom-

mend to a young man who can command the necessary time and means a preparatory course for a commercial life, it would be as follows, viz.:

A thorough training at a secondary school—such a training as would not only permit of his entering college without conditions, but would actually enable him to write legibly and spell correctly. I admit that I am old-fashioned when I suggest that an elementary knowledge even of chirography and orthography are essential to a liberal education, and I make the suggestion with hesitation. I am impelled to do so by the knowledge that there are some antiques in business who are so grounded in old methods that they insist upon consigning to the waste basket illy written and misspelled applications for situations, even though the letters be signed by college or university graduates. These old fossils have an idea that ignorance or carelessness shown in a letter of application written by a young man who has spent nearly all his early life in acquiring knowledge and gaining accuracy does not portend great success in a mercantile career.

Entering college, he should select the courses offered which will give him the best instruction in all that pertains to commerce and the most thorough discipline of mind. The coveted college diploma and university degree at the top of the tree of knowledge are becoming more and more attainable by the student who has been obliged to forego digging among the Greek roots or lingering upon those lower branches marked "B.C."

As no aspiring young man possessed of brains, who has a proper conception of what constitutes the best

manhood, the most real happiness, and the greatest usefulness in the world, will be satisfied with the prospect of a life devoted exclusively to business, he must, necessarily, broaden his education to meet the requirements of his ideal. The college or university course should include, not only commercial and kindred or related branches, but all classes of information and knowledge within reach which can be utilized in the life of an intelligent, broad-minded, public-spirited citizen. Business, like a profession, should be the means to an end.

After a diploma is secured, a year, if possible, is well spent in a retail establishment of the particular line of merchandising which has been chosen.

Then comes the elementary practice in a wholesale house, with, let us hope, a rapid advancement from one department to another, until the former college student becomes the head of a firm or the president of a corporation.

THE CREDIT DEPARTMENT OF MODERN BUSINESS.

DORR A. KIMBALL, CREDIT MAN, MARSHALL FIELD & CO.

Commerce and credit go hand in hand—they are inseparable. Practically speaking, the office or function of credit is to secure the willing transfer of capital from the possession of those who have it to those in need of it. Credit may be looked upon as an economic force of the highest importance, for in every civilized country credit has been absolutely necessary to develop great enterprises. Without it, no nation, no state, no community can be strong. Destroy a man's credit and you destroy the possibility of his making a success of his business. Think for a moment what an important factor credit has been in our own country. During the dark days of our Civil War, to use a stock phrase, the United States was *short* on money, but fortunately *long* on credit, and credit gave to the promise of the government at Washington a power sufficient to bring into the treasury over three thousand millions of dollars, all of which was forever lost and swallowed up in the horrible vortex of cruel war. But if our nation had had no credit it would have ceased to exist, and you and I would have been left in a worse condition than Edward Everett Hale's "Man without a Country." Again, when Chicago was destroyed by fire, scores of business men were thoroughly discouraged and utterly cast down, and many exclaimed: "We are ruined!" "Everything is lost!" "Poor Chicago

is wiped off the map forever!" Those men were in no condition of mind at that time to appreciate the miraculous power of credit, which soon brought new money to the work of reconstruction and made this city what it is today. Someone has pertinently said: "Credit is to business what mortar is to a brick wall—it is the adhesive material with which commerce is cemented." A few years ago I was an eyewitness of a great commotion at the corner of Adams and La Salle streets, where our great Illinois Trust and Savings Bank was then located. Men, women, and children crowded into the office of the bank, and a line of depositors extended far out into the street. What was the matter? These people were alarmed; they had serious doubts as to the credit of that bank. Now the bank was perfectly good and remained open long after business hours to attend to the wants of its customers, and night after night the tellers remained at their posts paying every depositor who called for his money, the result being that several hundred thousand dollars were withdrawn from circulation and locked up in safety deposit vaults as so much dead capital for the time being. Thus it will be noticed that all this disturbance and excitement was occasioned by a doubt as to that bank's credit. Panics originate in like manner—not for lack of money, not for lack of work, not for lack of trade, not for lack of food, but simply for lack of credit. Credit is the legitimate offspring of confidence, and confidence is the rock (the great Gibraltar) on which the vast commercial interests of this world are resting. Annihilate confidence, and immediately you destroy credit and com-

merce, and civilization with all its benefits will follow in the train of their destruction. Unless we can have faith and confidence in each other's honesty, there can be no credit, and without credit there can be but little business, as credit and confidence are inseparable.

When a wholesale dealer sells goods, he sells for cash or on credit. Some transactions are called *cash* transactions when in reality they are purely matters of *credit*. To illustrate: A merchant residing in Nebraska visits Chicago to buy goods (he says) for cash, but sometimes he means this: When the goods are received at his store in Nebraska and the bills are checked off, then he will remit for them. Now, if the wholesale dealer agrees to this, he makes a *credit, i. e.*, he trusts that man at least a few days from the time the goods leave Chicago until the money is received according to this arrangement.

Buying and selling constitute trade, and if every trade were made strictly for cash, the merchant who could buy the most and sell the most to the best advantage would make the greatest success. But right here every dealer faces this fact, that most of the business of this world is done on credit; that is to say, the seller parts with his property and receives from the buyer a substitute—a promise of future payment, sometimes in writing, but frequently verbal; and I have known of occasions when that was all the seller ever did receive.

Now, the fulfilment of this promise depends upon several things: First, the buyer's honesty; second, his ability; third, his experience; and many other things. If the buyer is honest, the seller's safety depends upon

the buyer's success; and the buyer's success is dependent upon his qualifications, and other circumstances over which he may or may not have control. Every large wholesale house employs a person whose special work is to look after the credits of that establishment, and he is called the "credit man;" and if he proves a credit to his employers, he will always trust the proper parties and decline credit to those unworthy of it. He should be careful, cool, courteous; not too hasty, but possessed of sufficient courage to back up his convictions. He ought to be a good judge of faces, for often the countenance is the index to the heart; and if he can detect quickly when a man is not telling the truth, it is of great advantage. A dealer once said to me: "Beware of so-and-so"—naming a would-be purchaser; "when he tells you about his resources, it is always best to deduct 75 per cent. from his statement; and if he makes it pretty large, you would better take off 10 per cent. extra, and the result will then be pretty near correct."

I am going to ask you for a few minutes to think with me of some of the fundamentals that a good credit man bears in mind when performing the duties of his occupation.

Fundamental No. 1: The very first point that a credit man wishes to settle in his own mind is that the party seeking credit is honest. "An honest man is the noblest work of God," is a very old maxim, but it is just as true today as when the words were first uttered. "Honesty is the best policy," is another truism, which is thoroughly understood in every condition of life. From a purely commercial standpoint a man's reputa-

tion for honesty is the best asset he can have in his business: I know it is true that we sometimes hear men say facetiously that such old-fashioned adages about honesty sound very pretty, they are very nice sentiments, but really the up-to-date man of the twentieth century conducts modern business on new lines and has no particular use for maxims that should be consigned to a state of innocuous desuetude. Never was there a greater falsehood uttered. Not only do honest men believe honesty is the best policy, but dishonest men believe it too. Of course, the latter class cannot speak from experience, but they learn by observation. An old merchant of the "David Harum" type said to a young man just entering upon a business career: "See here! start right! always remember this: Honesty is the best policy. I *know*, because I have tried both ways myself." Secretary Gage of the United States Treasury in an address laid down this axiom: "All good men love the approval of the good, and all bad men are held in check by fear of a good man's reproach." When a man is known to be lacking in honesty, no one wants to take any chances on him or have anything to do with him, and the credit man's happiness increases as he hears the sound of that man's footsteps receding in the distance.

Fundamental No. 2: After a man's reputation for honesty is settled in the mind of the credit man, very naturally he wants to know about the ability of his prospective customer to carry on his business successfully. Ability in the abstract is one thing, but ability in the special line of one's undertaking is quite another thing. Statistics are often cruel; they inform us that

less than ten of every one hundred men engaged in business are successful during their whole lives. Is not this a sad commentary on humanity? Something must be radically wrong somewhere. One thing appears to be certain: there are too many "misfits" in life. I have known a first-class farmer to sell his farm and invest the money in a mercantile establishment, and then make a failure. Why? He was a good farmer, but he had no experience in keeping a store. Most good lawyers would make poor physicians. A person should choose that profession or vocation which is suited to his particular ability, but too often the "round" men get into "square" places, or the "square" men get the "round" places, and the result is a misfit; but it is not discovered early enough to make the change; and I believe that some of the sad tragedies of life can be traced to this cause.

Thirdly: A man may be honest and possess great ability, but if he lack application and industry, his chances of success are precarious. This age is one of push and of competition, and there is no place for lazy men. The merchants' path is not strewn with roses, no matter how attractive it may appear to the outsider. "Jacob, my son, take good care of your store, and by and by your store will take care of you!" This was the advice of a Hebrew father to his son. Application to business is the strong element toward success. I heard a story the other day which may serve as an illustration. Mr. Rosenberg was teaching his son to be a clerk in his clothing store. While the father was absent at dinner the first day the boy began his service, the boy sold a suit of clothes and naturally was quite

elated. On the return of his father the boy asked him if he did not think he was making splendid progress. The father, fearing his son might arrogate to himself undue importance on account of the transaction, said: "My boy, that man wanted a suit of clothes, didn't he?" "Of course he did," exclaimed the boy; "and I was smart enough to sell him!" "Well," continued the father, "you still have many things to learn. When a man comes in this store and wants to buy a suit of clothes and you sell him, that is all right; but, my boy, when a man comes in this store and doesn't want to buy a suit of clothes and you sell him—Levi, *that's business.*"

The modern, up-to-date credit man should be like the apostle Paul in this respect: He should be a man of great faith — faith in his fellow-man. Paul's eleventh chapter of Hebrews is nothing more nor less than a statement of wonderful things accomplished by the use of faith. Paul says faith is the substance of things hoped for—the evidence of things not seen. The credit man's definition is the same. I never look at a mercantile ledger which contains accounts against customers to whom credit has been given without thinking that the ledger represents Paul's idea of *faith,* for in it will be found the substance of things hoped for—the evidence of things not seen. Therefore it can be truly said that, just as the exercise of faith is required in all spiritual matters, likewise faith is the dominant element in commercial life.

I have thus far dwelt on the importance of things which in themselves alone do not pay bills; that is to say, no one can take $1,000 worth of honesty, $500 worth of ability, and $100 worth of industry and exchange these with a wholesale dealer for dry goods, unless the applicant is possessed of a certain amount of capital. While it is true that absolute confidence in the integrity of the buyer is the great consideration for which credit is given, yet in most cases the dealer would also require for his safety that the buyer should possess some capital of his own; and the larger that capital, the better it is for both debtor and creditor. The amount of capital required in any particular case to insure safety and success is an uncertain quantity, for the reason that some men have the faculty of making money under the most unfavorable circumstances, while others, even more favorably situated, can never make both ends meet; therefore the credit man is obliged to consider in every individual case the elements that go to make up a good business man. To illustrate: Here is a certain young man just commencing business. He has been a clerk for many years, and has had considerable experience in the kind of business he is now undertaking. He has been economical and has accumulated a few hundred dollars, saving it from his salary. Now, every dollar of his capital has an enhanced value to him. In the first place, he earned it himself; and, secondly, by practice of rigid economy he has saved it; and having both *earned* and *saved* he understands the value of money as no one can who has done neither. Such a young man is worthy of confidence. But, on the other hand, here is another young man just commencing, with little ability and no experience whatever. Some kind, well-intentioned uncle or aunt has furnished him

capital to start with, and the world smiles and says: "What a lucky young fellow! There is no end of money behind him!" But my observation proves that in about nine cases out of ten the end of his money is seldom long in being reached. The credit man finds but little difficulty in handling a case of this kind, for if he sells this young man without the guaranty of his relative or some other responsible person, he can blame no one but himself if he makes a loss. Some merchants, however, are so anxious to sell goods that they permit this desire to interfere with their better judgment in making a credit. If it were a question of loaning money, oftentimes they would hesitate before making a loan to some whom they do not question when making a credit for merchandise. The trouble with this class of dealers is that they look upon merchandise as something that must be kept moving, and sometimes they find themselves in this predicament, that both their customer and the merchandise sold him on credit move so far away that they are never heard from again.

The question naturally arises: How does the credit man obtain the necessary information to enable him to determine what is best to do? A personal interview always gives him an opportunity to learn from the would-be debtor what his condition is. Now for a moment please imagine you are all credit men, and I am, say, John Smith, a country merchant living at Wichita, Kan., and I come into your establishment for the first time wishing to replenish my stock, and I inform the salesman to whom I am assigned that I desire to purchase goods on the usual credit terms.

The salesman is very polite and says to me: "I am very glad, Mr. Smith, to see you, and our credit man who passes on these matters will also be glad to meet you. I will introduce you to him. He presents me to you, and you in a kind and gentle way begin to question me in reference to my business affairs, perhaps somewhat like this: "How large a stock of merchandise have you on hand at present?" And I reply: "Five thousand dollars." You then ask if I sell my goods on credit or for cash, and I reply: "For cash." "Have you any other resources?" "Yes, I have cash on hand, *i. e.*, on deposit in the First National Bank of Wichita, one thousand dollars." "How much do you owe?" "I owe nothing, having paid all my bills in full before coming to market." "Do you carry any fire insurance?" "Yes, four thousand dollars." "How much rent do you pay?" "Twenty-five dollars per month." "How many goods do you sell a year?" "About fourteen thousand to fifteen thousand dollars worth." "How large a bill do you wish to purchase from us?" "About two thousand dollars." Now, Messrs. Credit Men, during your interview with me you have formed your opinion of me from what I have said and from the way I look. If I have impressed you as a truthful man, an honest man, and if your judgment is not at fault, you would be perfectly safe in saying to me: "Mr. Smith, we will be pleased to extend the line of credit you ask, and hope this is only the beginning of many transactions which will prove mutually satisfactory." Messrs. Credit Men, if you will glance at this statement of my affairs, you will perceive I am a first-class risk, provided I have

been telling you the truth. In the first place, I have no indebtedness at present, and it is always what a merchant *owes* that gives him anxiety and trouble; and the same thing applies to the life of a university student. Secondly, if my store should catch fire, I have the stock covered with $4,000 insurance, and the chances are I would be able to save part of my goods; therefore the risk in this direction is very small. Thirdly, I am selling for cash; therefore I cannot lose anything in bad debts. Fourthly, my sales amount to over $1,000 per month, and therefore in sixty days I shall have sufficient money to pay my bill to you, even if I did not have $1,000 cash now on deposit in my bank.

Now, the next man who is presented to you, Messrs. Credit Men, is Mr. John Hardup, from Oshkosh, Wis., and you proceed to interview in a like manner and elicit the following information:

ASSETS.

Stock on hand	$28,000
Trusted out	14,000
Cash on hand	very small
Total resources	$42,000

LIABILITIES.

Owe bank	$ 7,500
Owe merchandise, not due	15,000
Owe merchandise, due	4,500
Total liabilities	$27,000
Net worth	$15,000

Carry $10,000 fire insurance; rent, $100 per month; sales, $35,000 per annum.

Now, Messrs. Credit Men, if you compare these two statements, it will be observed that Hardup thinks he is worth two and one-half times as much as Smith ($15,000 as against $6,000), and yet I do not believe that anyone of you would trust Hardup for a dollar's worth of goods. Why? In the first place his indebtedness is very large, and some of it is past due. Secondly, if fire should come, he has but $10,000 insurance on a stock of $28,000, the difference being more than the amount he thinks he is worth. Thirdly, he is carrying altogether too large a stock for the business he is doing. His sales are less than $3,000 per month, and if he were unfortunate in collecting his outstanding accounts, it would require many months' sales to cancel his present indebtedness. The only chance that I can see for Mr. Hardup to save himself from an inglorious failure is to have a going-out-of-business sale and reduce his stock, get a collector to collect his outstanding accounts as fast as possible, and apply every dollar toward reducing his indebtedness, and then commence on a smaller scale in a more favorable locality.

I think I hear someone say: "How do you know the information you obtain by personal interview is true? The would-be debtor might deceive you." Well, here is where the credit man has to exercise his judgment. It is usual for customers to give references to their banks and to other dealers with whom they have had an account, and by writing for this information it can be easily obtained. Then there are mercantile agencies who make it a business to collect information on the financial standing and responsibility

of everyone in trade, and they issue reference books which indicate the capital and credit of the parties reported; and by sending to them one can obtain a special report in regard to any particular party. While these reports are not always infallible, yet, considering how much these agencies undertake to do, it is surprising that they render so acceptable service.

The credit man, to be successful, must give considerable attention to many other matters to which the limit of this discussion will prevent even a reference.

In closing let us remember that when we make a credit we have parted with something of value, and for which value is to be returned at a future time; so we take chances on what time may do. Of what it will do no one can be absolutely certain. There is, then, a degree of uncertainty which attaches to all credit transactions, but we need not be without our bearings. The sailor with his chart and compass may be in the middle of a tempestuous ocean, but he is not altogether "at sea." By making use of the aids at his command and the experience of others before him in locating the danger spots his risk is reduced to a minimum quantity; and this is the ambition of every credit man.

BANKING AND INSURANCE

THE COMPTROLLER OF THE CURRENCY.

JAMES H. ECKELS, PRESIDENT OF THE COMMERCIAL NATIONAL BANK, CHICAGO.

The Comptroller's office was created by an act passed in 1863. The duties defined by the statute were that he should have the supervision of banks to be organized throughout the country, known as "national banks." These banks were compelled to deposit with the Treasury Department United States bonds to be held as security for their circulating notes, thus providing a sound bank currency and at the same time creating a market for the bonds.

It was the intention of those who created the act that the office should be kept out of politics. It was created for a distinct business purpose, having a close relation to the commercial and financial interests of the country, and the situation required that the Comptroller should be free from all political bias, and that the office should remain outside the realm of politics. So far as the Comptrollers of the Currency have been concerned, they have, as best they could within their power, kept the office out of politics and made it distinctly a business office.

In accordance with this idea, the incumbent of the office was to be appointed by the President of the United States upon the suggestion of the Secretary of the Treasury, and to hold the office for a period of five years, thus extending it beyond the incumbency of the presidential office. The Comptroller could not be

removed from office except by charges filed by the President, and action taken thereon in the form of impeachment—the only office, with possibly the exception of the Director of the Mint, where removal cannot be had except on charges filed with the Senate.

There is a nominal affiliation between the Treasury Department and the office of the Comptroller of the Currency, but the Comptroller's office, differing from any other connected with the department, does not report on what goes on within the Comptroller's office, either to the Treasurer or to the President, nor does the Comptroller report either to the President or the Secretary, but he reports directly to the Congress of the United States, being required to give annually the conditions of the banks as they are on a certain day prior to the convening of Congress, together with such recommendations as would, in his opinion, improve the banking conditions of the country. The salary of the office, like that attaching to all positions under the government, is very meager, being only $5,000 a year; and yet there are a good many people willing to accept the place.

The act creating the national-bank system and the office of Comptroller sets forth what shall be done to create a national bank. It gives the number of persons who may take a charter (not less than five), and fixes the minimum amount of capital for such banks, that being not less than $50,000 in cities of not over 6,000 inhabitants, and from $100,000 to $200,000 in cities of larger size.

The office in its organization had three or four departments. The Organization Department receives

the applications for the creation of a national bank. The application must set forth the names of those who are seeking the charter, the amount of capital, the population of the city, etc. When the application is received, the Comptroller examines it to ascertain whether or not the persons applying should be granted a charter; and if, in his judgment, a charter should not be given, it is not granted. This is not the result of any statutory requirement, but a course which the office has assumed of itself without any question as to its right. The great powers of which the incumbent of the office is possessed are powers which he has assumed rather than received by legislative enactment, and their assumption and continued possession come largely from the fact that the banking institutions over which he presides realize the importance of the Comptroller's hands being upheld, if the banks are to be healthful and sound institutions.

The bank, having been granted a charter, is given a name, that which the incorporators select always being given, unless at that time or prior the name suggested has been used by another bank. The bank, having then deposited with the Treasurer of the United States the minimum amount of bonds, may now take out circulation. There have been a good many banks, especially in the larger cities requiring a minimum amount of $50,000 bonds, which have never taken out any circulation whatever. I think there are few banks that have the maximum amount of circulation which the law permits them. This is on the principle that there is not any profit in the circulation, and that it is better to leave the bonds without taking out the cir-

culation, paying the tax, and going to the general trouble of having the circulation issued.

After the bank has been established, it comes under the active supervision of the Comptroller of the Currency. Under the act he is empowered, subject to the approval of the Secretary of the Treasury (and in that alone has the Secretary any control over the Comptroller's office, exercising the same right that the Senate of the United States does over the appointment of the President of the United States), to appoint a number of men to the office of National Bank Examiners. Their duties, under the direction of the Comptroller of the Currency, are to visit the banks in the districts to which they are appointed. Here again comes into play the power assumed on the part of the Comptroller, for he makes it the duty of the examiner, not only to see that the capital stock is intact, but to see further that all the methods of banking employed in the bank are of a character that insures not only safety to the public, but benefit to the stockholder. As a result, the examiner not only sees that all the cash is there, but he takes upon himself the duty of seeing to it, as far as he can, that the paper held by the bank is genuine, that the notes are of the value that they represent themselves to be, and that many other details are properly administered. Thus it happens that when an inspector comes into a bank and finds an old-fashioned method of bookkeeping employed, he reports that fact; he also ascertains the salary of the various officials, the amount of rent paid, and all other details which enter into the conduct of a bank. The same method of examination is pursued whether in the

National City Bank of New York, with a capital of $10,000,000, or in the smallest bank of medium capital. The great strength of the national-bank system, the great source of its influence over the banking system of the country since its establishment, has arisen from the very uniformity of the control exercised in the Comptroller's office, bringing about in the individual banks, whether in Chicago, New York or elsewhere, the same method of bookkeeping and the same details which are necessary to the careful management of a bank.

The examiner's report is made to the Comptroller of the Currency, and thence sent to the Department of Reports, where there is a large force of clerks to examine these reports, see what is defective in the bank, and compare with the previous report. Upon the basis of these reports the Comptroller of the Currency writes to the president or directors of the bank, suggesting steps to be taken to strengthen the position of the bank.

There is another division of the Comptroller's office, known as the Redemption Department, where mutilated and worn-out bank notes and the notes of banks which have gone into liquidation are redeemed. Another department, known as the Issuing Department, issues to the banks the amount of bank notes to which they are entitled. Until the recent Bank Act, during the administration of President McKinley, the amount of circulating notes to be issued on the deposit of bonds was 90 per cent. of the par value of the bonds. But under the present act, the total value of the bonds may be issued upon the 2 per cent. bonds which were the refunding bonds of the last administration.

As to whether a bond-secured circulation is a wise circulation there are a good many suggestions. Safety does not enter into the question so long as the bonds of the United States continue good; which will be as long as United States revenues are collected; which will be as long as the people are able to pay internal-revenue taxes or duties on imported goods.

It has been suggested that the method of issuing bank-note currency is not desirable, because it gives to the creditor of the bank who is a note-holder an advantage over the creditor who is simply a depositor, in making the former preferred over the latter. Under the existing bond system the note-holder is a preferred creditor, because before the bank gets started into active operation so many of its assets are taken in the shape of bonds and deposited with the Treasurer of the United States to secure bank notes, these bonds being sold in case of failure of the bank, and the amount received from the sale being used to pay the claim of the preferred creditor, who holds the notes of the bank. In case there is not a sufficient amount of money received from the bonds to pay the notes, the act provides that the note-holder shall have a prior lien on the other assets of the bank, out of which he shall be reimbursed before the payment is made to depositors.

Another objection which has always been found has not arisen from the idea that the safety could be improved, but is that with a note circulation amounting to only 90 per cent., or even to par on the deposited bonds, the premium on the bonds over their par value is always tied up. When the banks were allowed circulation equal to 90 per cent. of the par value of the bonds and the bond was selling at 100 to 115, there was always twenty-five dollars locked up, not available for loaning purposes; and even at present there is still eleven dollars taken out of the active channels of business and permitted to lie in Washington, a source of profit neither to the bank nor to Congress.

So there are some very valid objections to the provisions for issuing notes by the banks, and I take it that as we make progress in the field of finance we shall come to understand what is the proper basis for a bank-note circulation, and we shall not be surprised if the bank-note issue shrinks to nothing, because it is more profitable to sell the bonds than to hold them as a basis for note issue. When a bank-note currency is based upon a security which varies in market value, no matter what may be the monetary needs of the country, if there is more profit in selling the bonds than in taking out notes thereon, the bonds will be sold.

If the bank impairs its capital, the Comptroller of the Currency notifies the directors and calls upon them to make good the deficit. In case they fail to do so, the Comptroller declares the bank insolvent and places it in the hands of a receiver. In this the Comptroller is fortified by the decisions of the Supreme Court of the United States. His judgment must control. When he declares that a bank is insolvent, there is no power in the courts of the United States to gainsay that, and he is clothed with the right to appoint a receiver to take charge of the assets. I remember an instance, when I was Comptroller, of a

bank in Tacoma which my examiner reported to me as having a reserve of only 6 per cent. whereas the requirement was 15 per cent., as it is in all but five or six large cities, known as reserve cities, where 25 per cent. is required. I ordered the examiner to declare the bank insolvent. The directors got out an injunction, but the judge declared that, while he thought it was all wrong for the Comptroller of the Currency to have more power than the President and Congress, he could not do anything but let him take charge of the bank if he so desired. This power vested in the Comptroller requires impartial action over all banks that come under his control.

The office differs from any other in Washington because there is absolutely no routine. Every case is an individual case, and the Comptroller must exercise individual judgment in every instance. The great responsibility that attaches to the office is due to the fact that the bank is the one necessity in every community that affects every business enterprise. The failure of the bank takes out of the business channels of the community more or less of the funds, and curtails the credit of the community. That was particularly so during the panic of 1893. During the thirty years of the existence of the office prior to my incumbency there had been 182 failures of national banks. During the first two weeks I was in office there were 165 failures. The result of the failure of so many banks was seriously to embarrass many communities, and the effect was very far-reaching. I continued to give a bank opportunity to do business if I found its managment sound and honest. It would be

assumed that a bank having failed once, and having suspicion attached to it, could never succeed in obtaining the confidence of the public. I tried the experiment, laying down certain conditions which were to be complied with on the part of the directors of the bank. Of the 165, I thus opened 115, and 100 of these proved to be very successful institutions. But there were many banks that did not fail, but were close to the point, and the question with the Comptroller was whether to close them at once or run the risk of their failure with ensuing disaster to the community. I remember one instance where I considered for a long time the advisability of closing a prominent bank in the Northwest. The institution had enjoyed high credit, but, because of investing in notes based on land booms in the neighborhood, the credit was seriously impaired. The examiner insisted that the bank should be closed, but I felt that I should take the risk. However, I put on it an assessment of considerable size. Many of the stockholders came to see me, and they finally concluded to pay the assessment, and that bank is now the largest in Minnesota.

As a result of bad banking or mistaken banking, banks are very likely to get themselves loaded up with assets not easily realizable, and when the pinch comes they fail and go into the hands of a receiver. The liquidation of these assets is not an easy problem, especially as the law requires that the receiver shall recommend what shall be done with this or that asset, that the Comptroller shall approve, and that the district court shall enter a decree authorizing the sale.

While it is provided that the bank shall not loan

upon real estate, a good many banks get such security by making a loan and then taking additional security in the form of a mortgage. I found in the failure of banks a good deal of such paper. There are many assets of a strange character. At one time I had a full equipment for an opera house. I had in a Dakota town a butcher shop. I had any amount of live stock. I had one trotting horse which sold for $10,000. In Puget Sound a certain bank had as part of its assets enough cans to can a large portion of the salmon caught in Columbia river. And there is hardly a thing you could name, from an article of wearing apparel to a large manufactory, that at some time or other does not in this way get into the hands of the Comptroller.

THE METHODS OF BANKING.

JAMES H. ECKELS, PRESIDENT OF THE COMMERCIAL NATIONAL BANK, CHICAGO.

Within the last few years the methods of banking have been much improved, not only in the large cities, but also in the country, all of which has come about, not as the result of any law, but through the business instinct and judgment of those who have had to do, not only directly with the banking interests, but also with the general business interests of the country. Improvement has become more noticeable within the last few years. Even the smallest bank now undertakes to exercise the same care and attention to details of bookkeeping and to details of information as does the large city bank, where the transactions are very much larger, and the interests conserved are of much greater importance.

The basis of safe banking is the acquiring of a proper knowledge of credit, and the acquiring of such knowledge in this country is much more difficult than in older countries. Probably this is because in this country, with so wide a range of territory and such possibility of changing business occupations, there is not the same knowledge continuously at hand of those who are asking credit as in older countries. In Scotland, where the best banks have been developed, it is an easy thing to obtain continuous information on the credit of any who may ask it. That arises from the fact that the people in a community in Scotland

change very little. The same business is carried on from one generation to another, and the result is that the banks in Scotland have a continuous knowledge of the antecedents of those employed in a business. It is quite different in this country, because of lack of antecedent knowledge, and also from the fact that there is not the continuous carrying on of the same firm from generation to generation. In time I think that thing will rectify itself; but at present the greatest difficulty which confronts a banker is to know how much credit to extend to a man in business, when to extend it, and when to curtail it. The necessity of such knowledge is essential to making a good banker. The too general extension of credit leads to over-speculation, with the result that in time the bank which has over-extended credit not only becomes the means of causing the speculator to come to grief, but also brings suffering upon the entire community.

At present the banks must rely, to some extent at least, on the mercantile agencies for information on the status of men engaged in business; but these reports have been found deficient in that they are so general in character and so limited in giving the information which is essential to forming a judgment as to the extension of credit.

The result is that several banks of importance have what is known as a credit department. This department is in charge of one or more men whose duty consists in ascertaining specifically what the financial condition of a man is, what his business habits are, and what his record is for financial integrity.

The result is that banks today have better equip-

ment for judging credit than ever before. This is extended to country banks and from city to city through the interchange of information. During the period of greater plethora of money, the country bank has been compelled to abandon a practice which characterized its banking prior to 1893, of merely loaning money to those engaged in local business, and as a result representatives of country banks from this section of the country, and by correspondence, even from the Pacific Coast, come asking to buy commercial paper. Thus instead of using their funds at home they use their funds which, under existing circumstances, cannot be used at home, in buying commercial paper. The result has been the necessity of knowing something more of credit than heretofore. A man comes into a city bank and he gives as reference some firm in Chicago, New York, St. Louis, or elsewhere. You would be quite surprised if you knew the changes that have come about in the banks of this city. Instead of their business being bounded by the city of Chicago or the state of Illinois, some of them carry on business with the East and with European countries. This has come about as a result of a change on the part of the business men of the country. At a time when the banker occupied an overpowering influence in the country, the business man did business directly with his own banker; but as the banker's business has increased and the funds at his disposal have increased, relations have changed. No one thinks the banker is doing him a favor by loaning money, but the banker feels that the borrower is favoring him by his willingness to come and ask for money and pay a rate of four per cent.

The business men in the larger firms do not borrow direct from the bank, but that is all delegated to commercial note brokers. Such firms as Franklin MacVeagh & Co., C. M. Henderson & Co. (and I might enumerate two-thirds of the larger firms of Chicago and elsewhere), do not borrow of the bank directly, but they go to a man whose business it is to buy commercial paper. They either sell him the paper or pay him a commission to sell the paper for them. The result is that the firm do not know whether their paper is in the Commercial National Bank of Chicago or the First National Bank of Boston, or the National Bank of Philadelphia. They get the check from the note broker, and when the note becomes due they are notified by the institution to which the broker has sold the paper that the amount is due on such a date.

The result has been beneficial in many ways. Not the least has been the growth of the idea that the country in its best interests is an entirety, and the sphere of the banker is not to be confined to a single community, but when he has a plethora of funds and no demand in his community, that it is of benefit to the community to transfer the credit he has to sell to another part of the country where there is not a plethora of funds and the money is needed. So the banker of any small community, not finding his funds needed at home, instead of letting them be a drug to him, is enabled to fill a vacuum which exists in one of the large commercial centers.

The other benefit, of great importance to the banker himself, is this: One of the things that troubles the

banker is how to have at certain seasons of the year enough money on hand to meet the demands of his own depositors and also those of his borrowers. Such questions always arise when the bank has as borrowing customers only its depositing customers. The moment money becomes tight, the depositor wants to withdraw his funds and also to borrow. Especially in the spring and fall of the year the banker finds he is embarrassed, for the existing banking laws require the bank to maintain a fixed reserve, and this restricts his power to loan; but under the system of buying commercial paper and timing the maturity of that paper, he is relieved of a good deal of this embarrassment. At those seasons when money is tight, he cannot demand of his depositing customer, who is also his borrowing customer, to pay up. If he should, the customer would say: "If you demand this payment of me, I shall have to go to some bank where they are not only willing to have me deposit, but where they will be willing to loan me money at any time, and instead of calling on me to pay at the time I need money, they will give me additional credit."

But that is not the situation with a banker who buys from a commercial note broker. The note maker is not a depositor, but an independent person with whom the only relation that exists is that the bank has bought from a third party some paper which must be paid on maturity without any objection; and the person who sells his paper through a broker never expects to get an extension and never does get it.

So every bank carries a certain amount of "boughten" paper with the expectation that when

these periods of tight money come there will be among the bills and discounts notes which are expected to be paid at maturity, and which as a rule are paid at maturity.

There are some bankers who think there is a risk run in extending credit beyond the community where the bank is located; but by careful study of credit and by care in buying there is not so much risk as in a great many of the transactions carried on. The losses incurred have not been from any purchased paper of firms distant from Chicago or in Chicago; but the losses have come from loaning money to customers who are also depositing customers, and where renewals are frequent and a situation arises where the bank, having loaned the customer so much money, feels, in order to save the customer from failure, that an additional loan is necessary; and in a good many cases the additional dollar loaned has not saved the customer, but has meant so much loss to the bank.

I have thought that a bank organized for the purpose of receiving deposits, and paying a higher rate of interest than prevails in the average bank, but which would not loan a single dollar of its money to the customers, but which only bought commercial paper, would be a very paying institution. Since I have been at the Commercial National Bank we have bought in four years some $70,000,000 of commercial paper, and of that we have had only one note not paid at maturity, although it was paid later; and one of $10,000 on which there was a loss of $2,000.

These new methods have all been for the betterment of banking. The enlargement of the sphere of the

individual bank throughout the country has sometimes looked as if it might be the means of too much inflation of credit; yet the result so far has been of great benefit. The note broker himself, although he does not indorse, first makes an examination of the credit that ought to be extended to a customer, and satisfies himself that there are no risks. I was talking with a broker and he told me his average sales were over $90,000,000 a year, and that in seven years he had seen the failure of but two institutions from which he had purchased paper.

Through the encouragement on the part of banks that buy paper too readily and make easy the floating of paper of merchants, there is danger that a great many men in smaller places will get more money than they can use in successful ventures. But taken all through, the new departures in the methods by which a bank acquires its loans and discounts have been very successful.

In the large banks another thing which has operated beneficially is the strict adherence, especially since 1893, to the provisions of the National Bank Act prohibiting loans on real estate. Not that real estate is not a sure security, but money thus invested is not easily accessible. Prior to 1893 there was scarcely a community of any size that did not go through that delightfully exhilarating period of a boom in real estate. Cities were being built all over the country by laying out lots in cornfields and selling them at extravagant prices. Ultimately the notes received for these lots found their way into national and other banks, with the result that the depositor,

frightened by the thought that we were going to have a deluge of depreciated currency, asked for his money; but when he wanted it the banks could not immediately convert these notes, the basis of which was the real estate for which they had been given in purchase, and consequently a great many banks which were to an extent solvent were compelled to close their doors, though some of them afterward reopened. In the Comptroller's office it has even been questioned whether banks ought to have a considerable portion of their assets tied up in stocks and bonds. There is not, as a rule, much purchase of stock by the banks, but there is of bonds. The experience of 1893, and of every period of financial depression and demand for money on the part of depositors, has taught the banks that the one asset which was quickly convertible was commercial paper. In 1893, during the period of greatest stringency (May to August), reports showed that deposits were reduced some $200,000,000; the stocks and bonds remained practically unchanged; the real-estate holdings remained about the same; but the item which showed that it was convertible on maturity was the commercial paper which represented actual value. So if any of you engage in the banking business, you will find that the item which will give you the greatest satisfaction in a money stringency will be the items of loans and discounts represented by commercial paper; and the item which will give you the most trouble will be real estate, especially if it is in a city.

There are means provided for making all the loans that are necessary on real-estate investment. I can

remember when the loaning of money was simply a loan by one farmer to another. But all that sort of thing has changed because of better business methods. There is not now so much loaning by a farmer directly to his neighbor, and there is no institution now where the farmer brings in the actual cash; but it is all done by loan and mortgage, for example, by the state banking institutions, which are permitted to loan on real estate. The result has been to benefit the man who borrows on real estate, for he gets a lower rate of interest, and a longer term for his loan. Not only is it cheaper for him, but none of that ought to be done in a commercial bank because such security is not readily convertible.

A feature which has been developed within the last few years has been the establishment of large banks—something more than merely local institutions in the sense that a man comes in to borrow money to put into his business for a limited time. The great banks go farther than that. They finance great undertakings—railroads and manufactures—and that accounts to a considerable extent for the consolidation of banking institutions. This has come about by the demands of business. Take, for example, the First National Bank of New York or the National City Bank of New York. They not only do the ordinary banking business which the average bank does, but they manage great business undertakings for the government; for example, in the handling of the payment to Spain for the valuable acquisition in the Pacific. I remember a few years ago when the First National Bank bought a railroad. They did not take the rail-

road for a debt, but bought it outright, and sold it again, with the result that the profit on hand, which it would have taken a great many years to have made by ordinary banking, amounted to 29 per cent. to each individual stockholder.

And so more and more, as time goes on, the banking institutions of the country will develop into institutions which are organized in such a way as to utilize the available credits of the country for the profit of the business interests of the country; and I should not be surprised if a decade from now those institutions which we now look on as great institutions will be considered small because this country's resources will be so increased. I remember when one of the large banks of New York considered itself fortunate with $18,000,000. It now has deposits of over $170,000,000, with assets of something like $210,000,000, and a surplus of $13,000,000.

All this has come about through the increased riches of the country, on the one hand, and through increased banking on the other. The great thing in a community is to know how to make the bank available for business needs. Educating the people up to the habit of depositing in the banks is the greatest good that can come to a community, because every time that a bank receives a dollar that dollar becomes an efficient dollar which, through the use of checks, is able to perform not only a single transaction but many transactions. Where everyone in a community goes around with cash in his pockets, every transaction is carried on by money from hand to hand, which is not only expensive but bad, because it curtails

transactions of the community to the actual amount of cash in the community, instead of permitting it to go through the bank to be converted into credit which becomes an efficient agency for carrying on a great many business enterprises which would otherwise fail for want of means.

INVESTMENTS.

D. R. FORGAN, VICE-PRESIDENT OF THE FIRST NATIONAL BANK, CHICAGO.

There is a sense in which all business enterprises are investments. To build a ship or a railroad, to start a store or a factory, to pay wages or place an advertisement — to do anything, in short, which involves an outlay of money for the purpose of increasing it—is an investment of capital. That is the sense in which political economists use the word, but in common use it has a more restricted meaning, viz.: the outlay of money in the purchase of property or securities which are expected to yield a sure and regular income without further effort on the part of the investor. This discussion will be limited to what may be included in that definition.

At the outset it may be well to have a clear view as to what funds are available for investment; or to answer the question so often asked as to where all the money comes from to pay for the enormous issues of securities which are constantly being brought out. A recent writer on this subject begins with the statement that the bank deposits of the United States increased in the seven years from 1893 to 1900 by $4,000,000,000, and that "the effort to place this enormous amount of new capital has disorganized the entire field of investment." This is not correct. If the author had looked deeper, he would have seen that the increase in loans had kept pace with the

increase of deposits, and that the banks had no greater percentage of reserves in 1900 than in 1893. In fact, about the time this pamphlet appeared the banks in New York were under their legal reserves, and money was bringing good rates all over the country because it was scarce. Only such portion of the increase of deposits as represented the savings of the masses, or the surplus earnings of commercial enterprises, was available for investment. The remainder, which constituted by far the larger part of the deposits, represented only expansion of credit, and was not available for permanent investment. It is a common error to consider bank deposits as "money in the bank," whereas they are largely composed of credits on a ledger. When a banker lends a customer $100,000 he takes the customer's note and credits the customer's account with the proceeds. The transaction increases both the deposits and loans by $100,000, but adds nothing to the "money in the bank." Even when the customer draws his checks upon the credit, it does not necessarily follow that the money in the bank is reduced, for his checks either go to the credit of another customer of the bank or they find their way into another bank and are offset by similar transactions in that bank. This credit of $100,000 created by the banker discounting the note of his customer performs all that actual money can perform, and practically adds that amount to the resources of the business community while it is extant. If the credit has been wisely granted, the note will be paid when due by the customer accumulating enough credit balance in his bank account and then giving his check for his

note. That transaction will reduce the bank's assets and deposits by $100,000; but it will not increase nor diminish the "money in the bank." In only a small portion of the transactions thus accomplished by credit will actual cash be demanded, and against this the banker must keep a certain percentage of his deposits in cash reserves. If the credit be granted to a worthless customer who cannot retire it when due, then the bank loses the amount, because its resources are reduced by $100,000 while its liabilities remain the same. Right there in the difference between redeemable and irredeemable credit lies all the difference between good banking and bad banking, good currency and bad currency, good investment securities and bad investment securities.

Thus the increase of bank deposits was due more to the extension of credit than to an increase of actual money in the banks, or of funds looking for investment. In like manner, when deposits decrease it is a contraction of credit which takes place rather than a withdrawal of money.

In October, 1893, for example, there was more money in the national banks by $28,000,000 than there was in 1892, yet the deposits were $500,000,000 less on account of the contraction of credit due to the panic—the loans and other credit assets being correspondingly reduced.

In any financial discussion we shall soon go astray if we lose sight of the place and potency of credit. It is estimated that 90 per cent. of all business transactions are done on credit, and the currency used in the majority of cases composing the other 10 per

cent. is only credit in another form. In credit modern finance lives, moves, and has its being. It is not merely the means by which you buy and buy and pay bye and bye. It is difficult to define, but we may say it is the medium through which the representatives of property or value may be exchanged. The bank customer's note is in one sense only a slip of paper, but it represents all the property owned by the makers. In the same way bonds represent the property they are based upon; certificates of stock represent the capital of the company which issues them, and bank deposits stand for actual cash. Credit rests on confidence, which is simply a reflection of the existing conditions. When confidence prevails, credit expands easily—that is, the representatives of property and cash are readily interchanged. When confidence is shaken, credit contracts in proportion to the gravity of the cause, and interchange becomes correspondingly difficult. If confidence be destroyed, there is a panic, when it is almost impossible for the bank customer to negotiate his note, the railroad to sell its bonds, or the industrial company to float its stock. And all this happens while the money in circulation is little, if any, reduced.

The past five years have witnessed a remarkable expansion of credit in this country. The bank deposits increased about $3,500,000,000, and new stocks and bonds issued during the period probably reached a total of $10,000,000,000, while the total money in the country, paper and metallic, increased only about $500,000,000. In other words, for every new dollar in money added to the general stock, bank deposits increased $7 and securities $20. It is not

necessary, therefore, that money be available to absorb a new issue of securities. If there is room for them in this sea of credit, they may be launched and floated.

When a new issue of investment securities is made, it is generally set afloat as collateral to an expansion of credit by the banks which extend to the broker or bond dealer credit with which to carry the securities until a market is found for them among investors. The rapidity with which investors will absorb them, and the price paid for them, depend upon their desirability and the condition of the money market—or, more correctly, of the credit market.

If confidence abounds, people readily invest in the representatives of property—stocks and bonds—and this creates a strong demand and a high price. On the other hand, if confidence be shaken, people prefer cash or its representative—bank balances—of certain value to securities of uncertain value, and they are slow to convert the former into the latter; and thus the demand is less than the supply, and the price obtained is consequently lessened. When conditions are panicky, new issues of securities cannot be sold at all, and the holders of old issues become so anxious to convert them into bank balances of stable value that prices fall far below intrinsic value, and then it is "bargain day" in the credit world. Many rich men hold their reserves for such occasions, which constantly recur, and they grow richer by so doing.

The funds available for investment, which gradually absorb securities, come chiefly from the following sources, the first two of which have already been suggested:

1. Savings banks deposits—representing, not an expansion of commercial credit, but the savings of the common people.

2. That portion of the deposits of commercial banks which represents the accumulation of the profits of business and which may be withdrawn from business.

3. The funds of life- and fire-insurance companies.

4. The funds of educational, charitable, and benevolent institutions.

5. The funds of estates in cases where the executors decide to exchange the assets at risk of general business for permanent investments, which call for no business management on the part of the owner.

6. The funds of retired business men who follow the same course for similar reasons.

7. The investment accounts of commercial banks maintained for the purpose of having some assets which can be converted into cash immediately in case of need.

8. That portion of the increment derived from former investments which the holders do not spend.

In such good times as we have had during the past five years the combined demand from all these sources has been enormous; hence both the rise in the price of securities and the rush to create and float new issues which we have witnessed during that period.

I have not been able to find statistics which present a complete account of the increase in the supply of investment securities in the United States during the period I have named. Some idea, however, may be obtained from the amount of bonds and stocks listed on the New York Stock Exchange, although these are

but a small portion of the whole. For the five years ending 1901 there were listed $949,516,639 bonds and $1,443,850,208 stocks, exclusive of those which merely replaced old securities. In addition to these, every village, town, city, county, and state in the country has its own local securities. New issues are also constantly being created by new inventions, such as the telephone, the bicycle, etc., so that my former estimate of a total of $10,000,000,000 of new securities issued during these five years is probably not far astray.

Yet no question is more frequently asked than this: Where can I find a safe investment which will yield a fair rate of interest? And perhaps no question is more difficult to answer.

A man of little experience and superficial knowledge may answer readily enough, but the answer will come slowly from a man of conservative judgment. The desirability of any investment consists of three attributes: (1) safety, (2) profit, (3) permanency. All three, however, are relative terms. In investments there is no such thing as absolute safety, assured profit, or unchangeable conditions. United States bonds are today the highest-class investments in the world; yet men are still living who saw them go to a discount of 78 cents on the dollar. Within the last decade their profitableness has been reduced by half, and unless we have another war the indications are that they will all be paid off within our own day. All we can do, therefore, is to consider the relative safety, profitableness, and permanency of the different classes of investment. There are investments which are more safe than profitable; others which are profitable, but not

safe; and many which are neither safe nor profitable, but are certainly permanent.

We shall now consider the different kinds of investments offered in the United States, grouped as far as possible under four divisions:

I. PUBLIC SECURITIES.

At the head of this class stand *government bonds,* of which there was at one time outstanding over $2,500,000,000, but of which there are now only about $1,000,000,000. These are held chiefly by national banks as security for their circulation, or for government deposits, and by trustees for funds in cases where safety is a more important consideration than profit. They are as safe as anything on earth and always marketable, but they scarcely call for our consideration, because they no longer offer any attraction to ordinary investors. One of the striking marks of our national prosperity is the fact that American investors have recently been offered and have readily accepted participation in loans to foreign countries. Russian government bonds issued in connection with their great railway were taken at a price yielding 4 1-8 to the investor; the German loan of 1901, 3 3-8; the English short-time loan of 1900, 3.4; and the English irredeemable consols issued last year, about 2.6 per cent. Our own government's now yield less than 2 per cent. to the purchaser.

Next in order come state bonds. Their history is not one of the things we are proud of. A total of over $300,000,000 (principal and interest) of them is now delinquent by reason of repudiation on the part of

their makers. A large part of this delinquency is made up of what is known as "carpet-bag" bonds issued by southern states during the period of reconstruction and later repudiated on the ground that the governments creating them did not properly represent the people. But that is not true of all. Virginia, for example, has old bonds outstanding which were created before the war, and which you can buy for a few cents on the dollar. This is possible because the eleventh amendment to the constitution took away the right of private parties to sue states for payment of their debts. It is probable that the days of repudiation are past, but history sometimes repeats itself, and it is well for the purchaser of state obligations to remember that their payment depends entirely upon public morality. If he confines himself, however, to the bonds of states whose good financial reputation is necessary to the business interests of their citizens, the risk of loss which is inherent in all investments will be reduced to a minimum.

What has just been said regarding state obligations applies with equal force to the *obligations of municipalities*. There has been much repudiation also on their part, but most of it has been of bonds for which the people of the municipalities never received any consideration, the bonds having been issued during the speculative period succeeding the war in support of railroad schemes. Unlike states, municipalities can be forced to pay through the courts, and so numerous have such cases been that almost every point concerning the legality of municipal obligations has been finally decided by the courts. The opinion of a competent lawyer as to their validity is now enough to satisfy investors, and such an opinion is always offered by bond dealers when offering the bonds. Beyond that it is only necessary to ascertain the population, growth, and general prosperity of the municipality, and the relation these bear to its total indebtedness, in order to decide upon the desirability of its obligations as an investment. In many states the legal limit of such indebtedness is only 5 per cent. of the assessed value of the property within the municipality, and this is perhaps only 1 per cent. of the real value. With this safeguard, with our population increasing at the rate of 4,000 per day, and with the prevailing prosperity of our country, municipal obligations are now very popular investments. They yield, according to their grade, from 3.5 to 5 per cent. to the investor, and as a class they are one of the best investments in the market.

II. REAL-ESTATE SECURITIES.

The purchase of real estate itself may be considered as an investment if it is already improved and yields an income, or if the purchaser improves it immediately after its purchase. To buy unimproved real estate simply with the hope that it will increase in value in the future is a speculation, not an investment. Among men who have been successful in a small way the purchase of unimproved real estate is at times quite popular. The idea seems to be inherited that to own a piece of property is a mark of respectability and substance. The thought that it cannot run away or disappear seems to make it safe, and there is always the hope that it will increase in value. Nothing,

however, could be more delusive. In ninety-nine cases out of a hundred it would pay better to put the money in a savings bank at 3 per cent. interest. Even improved property is usually unsatisfactory as an investment. When taxes, depreciation by use and by change of style, repairs, insurance, periods of vacancy, and failure to collect rents are taken into account, the owners of real estate are generally disappointed in the net result. There are many notable exceptions, of course, but to own much real estate and get little out of it is so common that the term "real-estate poor" has come to be quite well understood among business men. The safest way to invest money in real estate is to buy it and lease it to others to build upon. In good localities the ground rent is assured by this means, and this makes one of the safest investments known. There is not enough of such business, however, to make it generally available.

Another way to invest money in real estate is to advance it on *mortgages,* with a margin which should not be less than 50 per cent. Even then you are not sure that you will not have to foreclose your mortgage and take the property. A fall of 50 per cent. in the estimated value of real estate during the currency of a mortgage even in growing and prosperous communities is by no means uncommon. The value of real estate is never more than an estimate—an opinion —in which it is always difficult to find two authorities who agree. There is nothing wilder or more extravagant than the ideas of otherwise sensible men on the value of real estate during a period of inflation. I remember a case in Minneapolis which will serve as

an illustration. A man after successful litigation became the owner of a tract of land near that prosperous city, valued in popular opinion at a million dollars. He became involved in debt to the extent of $250,000 and mortgaged all his real estate for the benefit of his creditors. The mortgage was foreclosed for the various creditors by the leading lawyer of the city—one of the ablest all-round business men I have ever known—who thus became thoroughly familiar with the property. The bank with which I was connected was one of the creditors, and I remember his telling me that the claim was quite good because the debtor would be certain to redeem the property from the foreclosure. It was not redeemed, however, and it fell to my lot to arrange a division of the property among the creditors. For that purpose I had another valuation made of the various lots, which amounted in all to about $70,000. On that basis the million-dollar property was divided, the best cash offer we could get being about two-thirds of that amount. In other words, the value of a tract of land contiguous to a thriving city of 160,000 inhabitants shrunk in popular estimation in a few years from $1,000,000 to less than $50,000.

Anyone wishing to invest his money in a real-estate mortgage should make sure that he is getting a first mortgage. There is nothing on the face of a mortgage or trust deed in Illinois and some other states to show whether a prior lien exists, and the palming off of a second or third mortgage as a first is not an unknown trick. He should also be satisfied that the title is clear in the name of the mortgagor.

This is usually evidenced by a title-guarantee policy which is sufficient in most cases, though by no means infallible. Then he should insist on seeing the property with his own eyes. No matter how reliable the mortgage dealer may be, a purchaser may, by visiting the property, discover something which may save him from an unsafe, or at least a slow and unsatisfactory, investment. It is not impossible that he may discover that the building shown to him by the mortgage broker as on the property is as yet far from completed, and that only part of the money represented by the mortgage has been paid to the mortgagor, the balance being represented by a credit on the books of the broker which is to be exhausted as the building goes on. In this case the investor must trust to the broker to see that the building is completed free of mechanic's liens and fit for occupancy. Whether it is safe to trust the broker depends upon his financial and moral standing—which opens up a new field of investigation for the investor. He should also inquire into the financial standing of the mortgagor. If that be unsatisfactory, the payment of interest is likely to be irregular, and foreclosure may become necessary on account of the mortgagor's difficulties, although the property itself may be quite good for the amount involved. Foreclosure is a slow, tedious, and expensive way of getting your money back, even if it does get it back.

One of the worst forms of investment in real estate, in my opinion, is *building and loan associations.* They are gotten up in most attractive forms to catch the monthly savings of thrifty people with moderate incomes. I know there are some of these in the older

parts of the country that are apparently successful, but my experience of them in the West leads me to consider them as, on the whole, almost the easiest concerns to get your money into and the hardest to get it out of that I know. Their plans seem so simple that anyone can understand them; nevertheless, one of my friends in Chicago, who is a thorough accountant, lost the savings of years in a building and loan association of which he himself was the annual auditor.

On the other hand, farm mortgages are one of the best real-estate investments. Swindlers have not been unknown along this line, but I believe the results to investors have been as satisfactory as in any line of investments. As in all others, prudence and common-sense must be exercised; but there are many corporations and firms of high standing engaged in the farm-mortgage business, and by dealing only with such, and avoiding certain states where the laws seem to have been made for the debtors, a safe and fairly remunerative investment in farm mortgages is easily obtained. On the whole, investors should remember that to invest safely and satisfactorily in real-estate securities requires more knowledge of business, more experience, and better judgment than to invest in almost anything else.

III. CORPORATION BONDS.

Under this head come, first, *railroad bonds,* which have absorbed more capital than any other investment in this country. In the year 1899 there were 187,781 miles of railroad in operation, the bonds on which amounted to $5,699,858,000, or $30,000 per mile. The interest paid on the bonds was $245,250,000, or

4.12 per cent. This great class of investment securities is composed of various kinds. We have not only first, second, and third mortgage bonds, but consolidated mortgage bonds, income bonds, convertible bonds, terminal bonds, collateral trust bonds, equipment bonds, etc.

Among such a mass and variety as I have mentioned there are many of inferior quality, and some of even worthless character. The chief guide for the investor is in the earning capacity of the road, and reliable information on that point is easy to obtain. If the road's net earnings are at least twice its bonded debt charges, and if the road is well kept up so that such earnings are likely to continue, the bond may be considered satisfactory in that respect. There is no difficulty in procuring good railroad bonds as an investment, if the investor confines himself to the issues of well-established roads, and is content with a return of 4 per cent. or a little less. It is when the bonds of new railway projects are offered that caution is necessary. It is a well-recognized principle in railroad building that the road should be made not only to pay for its cost, but to yield a profit to the projectors besides. In other words, there is usually some "water" in the first issue of bonds—to say nothing of the stock. The squeezing out of the water in times past has frequently been an expensive operation for the bond holders. The appointment of a receiver, the discrediting of the securities, the purchase of them by "insiders" at a heavy discount, the "reorganization" of the road, or the sale of it to a large system, and the final happy outcome for said "insiders," is a process with which

the student of railroad history is familiar. Nor have cases of actual fraud in this line of operation been wanting. Sometimes they break ground for a railroad with great ceremony. Then they proceed to break the shareholders without any ceremony. The Arkansas Central Railway Co. built only forty-eight miles of its projected road, but its promoters succeeded in floating $5,000,000 in bonds of one kind or another on it. The road was so poorly built (what there was of it) that it was almost worthless. When it was sold by the receiver at public auction, it brought the sum of $40,000, and even that was paid to the receiver in his own receiver's certificates, which had been bought at a discount. Such cases sufficiently illustrate the kind of dangers to be avoided in this class of securities. Our railroads at present, however, are in better condition than ever before. As a rule, they are properties of enormous value and productive power, and no better securities, as a whole, can be had than properly selected railroad bonds.

Another large and rapidly growing class of bonds is composed of the issues of corporations operating public utilities, such as street railways, telephones, gas and electric-light plants, etc. Those offered in the market, however, are frequently new and based on properties in course of construction. They are disposed of on "estimated" earnings and well-written prospectuses. In such cases investors should never forget that, as a rule, all the risk of the enterprise is put upon the bond buyers. If it turns out a success, their investment will be good and they will get their 5 per cent. per annum. All the rest of the "estimated" profits that illumine the

pages of the prospectus—be they ever so large—will go to the promoters of the scheme, who, as a rule, have put in no money of their own.

If it turns out a failure, the bondholders will be the only losers. This division of profit and risk does not seem quite equitable, but it is astonishing how ready many people are to accept it. The moral is plain: Never invest your money in the bonds of any such enterprise until it is completed and can show actual net earnings of not less than twice the amount required to pay the interest on its bonds.

Many of these enterprises are legitimate and profitable, and offer good security for their bonds. But it is time enough to buy the securities after their safety has been demonstrated by actual experience. This is a good rule, indeed, in regard to any investment.

There is another class of bonds somewhat similar to those last mentioned—*waterworks bonds*. The provision of law, before alluded to, limiting the borrowing power of municipalities to 5 per cent. of their assessed property value, prevents many towns from owning their own waterworks. The plan usually adopted is to form a corporation to which an exclusive franchise is granted to build waterworks. A contract is then entered into between the municipality and the water company, by which the latter undertakes to supply the former with a certain number of hydrants for fire protection, etc., for a certain sum per annum. This annual payment is then used to form a sinking fund for the retirement of the bonds issued to cover the cost of the waterworks. The company has also the right to sell water to the inhabitants, and the

enterprise is frequently a profitable one, forming a safe basis for the issue of bonds. As usual, however, there are numerous dangers to be avoided, and possible losses to be feared.

One of these is that the water supply may not prove sufficient. Another is that the construction of the works may be cheap and not last as long as the life of the bonds. Still another danger is that the municipality cannot be bound by its contract longer than the life of the council which made it. A succeeding council may reduce the price paid for the hydrants. The greatest danger of all is that the company may get into a fight with the city; that the citizens may claim that the water is impure, and that as a result the waterworks may be abandoned and another water supply adopted. When I lived in Duluth, I witnessed such a fight brought about by an epidemic of typhoid fever. When the fight began, the water company's bonds were considered a first-class investment, and its stock was very valuable. When it ended, the bondholders got seventy cents on the dollar and the stockholders nothing.

I might go on discussing miscellaneous bonds, but it is not necessary. Enough has been said to indicate the dangers to be guarded against, and to show that careful investigation before buying is a necessity; for while there are good, safe investments offered in all classes of bonds, it is easy to lose money.

IV. STOCKS.

The great difference between bonds and stocks is that, while the former are a lien on property of one

kind or another, the latter frequently represent nothing more tangible than earning capacity, good-will, and the hope of the future. These are sometimes assets of great, but always uncertain, value. As a rule, it is the hope of a rise in value which leads investors to purchase stocks, and this brings a speculative element into the transaction. Of course, stocks are not all equally speculative. Bank stocks, for example, with their sworn, published statements, and the safeguards of government inspection, are not to be classed with mining stocks, about which nothing published is ever true, and of which no inspection is ever disinterested.

Another vital difference between bonds and stocks is that the former is a promise to pay both principal and interest, which can be enforced by law, whereas stock promises nothing. In other words, the holder of a bond becomes a creditor of the makers of the bond, whereas the holder of stock becomes a part of the company issuing it, and to that extent a debtor for all the liabilities of the company. In some cases (notably in bank stocks) the holder of the stock is liable for as much again as the face amount of the stock.

Among stocks *railways* form the largest and most popular class. The total amount of them is slightly greater than that of railroad bonds, viz., $5,742,000,000 in 1899, while the dividends paid amounted to $109,000,000, or 1.90 per cent. In such a vast total there is, of course, great variety, grading all the way from first-class to worthless. Most of them are listed on the New York Stock Exchange—a fact which has both advantages and disadvantages from an investment

standpoint. The chief advantage is that they can be readily sold, but this is outweighed by the fact that they can be as readily manipulated for stock-jobbing purposes. As a class, they cannot be recommended to investors who desire something that they can "go to sleep on." They require constant and intelligent watching, and only those who are capable of giving that to them should put their money into them.

Another large class of stocks which has come into special prominence in the last few years is that known as *industrials,* which are chiefly the preferred and common stocks of the large corporations commonly called "trusts." The extravagant way in which most of these combinations have been capitalized has filled many conservative minds with vague forebodings of coming disaster—moral, financial, and national—as the final outcome of the movement. But we should not confound the manner of doing a thing with the thing itself. We may admit that the promoter's profit has been the chief motive in most of the combinations, that capitalization has been extravagant, that speculation has been overstimulated, and that great danger exists in the fact that the caution which should control the investor has already given place to the craze for large and quick returns. But the movement itself will outlive these accompaniments, if it is economically sound, and if it leads to the greater and easier production of wealth. In my opinion, the so-called trusts are here to stay. The college presidents may rage and the politicians imagine a vain thing, but no law can be formed which will make it a crime for any number of people to combine their capital and ability

in any legitimate business. Laws may be and should be enacted for the regulation of the combinations for greater safeguards to the investing public, and for the protection of competing smaller concerns against monoply. Compulsory publicity of the condition of the corporations would go a long way in the right direction; but all talk of stopping the movement is vain. It is clearly an economical evolution from the evils of excessive competition, and much can be said in its favor. Its tendency is toward economy of production by the saving of all wasteful and unnecessary expense; and this is in harmony with the spirit of the age, which is ever improving on old methods and machinery. Its tendency is always toward a larger ownership of the property represented by the corporation and a wider distribution of the profits. There are now thousands of owners where there were but hundreds. Competition is now between nations as well as individuals. Consolidations have had their share in placing this country at least a neck ahead of our greatest competitors in the international race. How they will affect, or be affected by, hard times remains to be seen. It is probable, however, that a few great vessels will weather a storm better than many small craft. When great changes are going on, it is natural to have some apprehension as to final results, and easy to prophesy evil. When Rowland Hill's penny-post scheme had gained such support as to have its adoption proposed in Parliament, Sir Robert Peel, the greatest financial minister of his day, was its strongest opponent, and prophesied nothing but loss and failure as results. All the great movements in history were

fiercely opposed by some of the ablest men of the time who were specialists in the particular matter in question. Looking back now, their opposition seems absurd. And so when our theoretical economists predict disaster from this movement, I say we must wait and see. None of the calamities has happened yet.

A great railroad resembles a modern trust in many respects. It is generally controlled by one man, but owned by thousands. It pays its stockholders better, serves the public better, advances national development better, and makes transportation vastly cheaper than a hundred small roads could do. In fact, the industries now being combined into large corporations are only following the example of the railroads. Of course, there is always the danger that things will be overdone and tendencies carried too far. But against this there is an intelligent public sentiment which will have to be reckoned with. I believe the so-called trusts will live; but they will live only by proving that their existence is a benefit to the people and not a curse. This, I think, they will be able and wise enough to do.

I submit, therefore, that the field for investment known as "industrials" should not be passed by with a timid epigram, but is fairly entitled to consideration. Here, even more than elsewhere, investigation of the facts, guided by common-sense, is a necessity. The common stocks composed entirely of water and given away as a bonus to help sell the preferred cannot be classed as investments, and many of the preferred stocks represent so extravagant capitalization that they

also should be avoided. But for investors capable of intelligent investigation before, and supervision after, purchasing their investments some of the preferred industrials offer a legitimate and profitable opportunity. I have in mind a large company whose products are used in every household of the land. It is provided with sufficient working capital so that it is never a borrower, and it has no bonds, except a small amount existing on some of the plants before they were acquired, which cannot be paid until they mature. It has earned dividends on its preferred and common stock from the beginning, and is piling up a good reserve fund besides. It has a staple business and is excellently managed. I fail to see, therefore, why its preferred stock, or the preferred stock of any other "industrial" in like circumstances, is not a safe and legitimate investment for a business man capable of keeping an intelligent supervision of his affairs.

In addition to these great classes there are miscellaneous stocks too numerous to be here discussed. With regard to them as to all other securities, few general rules for insuring safety can be stated. My object in this discussion has been simply to hint at the dangers to be avoided, and to suggest the lines of investigation to be followed in buying the common securities which our market offers.

It may be said, however, that the safest general rule is to be content with a moderate rate of interest. From 3½ to 5 per cent. is all that can now be looked for in securities which will require no watching on the part of the holder. One per cent. more return on an investment usually means at least 10 per cent. more

risk of losing the principal. The days of large returns on securities offered to the general public are over, and all flaming advertisements or well-written circulars which promise high rates of interest should be passed by as little better than frauds.

An investor should never allow himself to be hurried into buying anything on the ground that if he does not buy at once the opportunity will be gone. He should take time to see the property or to read the document. This may save him much time, worry, and loss. It is wise not to put too many eggs into one basket, and not to buy when everyone else seems to be buying the same thing. Above all, he should never expect something for nothing. Anything that can be got for nothing in the business world is pretty sure to be worth nothing, but to cost something in the end.

The rate of interest on investments has been steadily declining for many years, but is now, in my opinion, as low as it is likely to go for many years to come. We are only beginning to realize the tremendous resources of our country, and until they have been fully developed, capital will continue to bring fair returns.

You young men are going to enter business life at a time when the future is big with opportunity. During the next twenty years America should take its place as the greatest and richest commercial nation the world has ever seen. I wish for all of you a large share in the work of bringing that about, and in the fruits of our national prosperity.

FOREIGN EXCHANGE.

H. K. BROOKS, MANAGER OF THE FINANCIAL DEPARTMENT, AMERICAN EXPRESS CO.

Foreign-exchange transactions are generally regarded as being quite complicated, and although there are some operations requiring experience and patient study, the system as a whole cannot be said to be any more intricate than many of the problems daily arising in mercantile business.

The reason of there being so few, comparatively, who have a thorough knowledge of the subject may perhaps be attributed to the fact until recent years the business was confined to the leading banks at large trade centers. Other banks having call for foreign drafts, letters of credit, or other foreign paper would obtain the same from the large banks mentioned or refer customers to them direct.

The enormous growth of our import business, the large increase in foreign travel, and the extension of our trade to nearly every country in the world so greatly increased the volume of foreign exchange transactions that it naturally invited competition, and today almost every bank and financial institution at a place of any importance is equipped with the facilities necessary to meet the demand for this class of business of its patrons.

Merchants who formerly imported goods from foreign countries through brokers at seaport cities now have foreign departments for the transaction of the

business direct. Our manufacturers, who formerly did not think of looking beyond the limits of this country for a market for their goods, have learned, through a better knowledge of the conditions, that they can successfully compete with foreign manufacturers. Our war with Spain is said to have opened the eyes of our manufacturers to the fact that there was a vast population outside of the United States who were dependent for many commodities upon countries which were in no better position, geographically or otherwise, to supply their needs; and if we judge from the large increase in our exports since the war, there was, no doubt, some foundation for the statement.

In an article recently published in one of the leading financial papers—the New York *Financier*—it was stated that the demand among bankers and large mercantile houses for young men having a general knowledge of foreign exchange and foreign shipping very greatly exceeds the supply; that students fitting themselves for mercantile life should devote as much study as possible to this branch, since it would be a very valuable acquisition to their fitness for the present commercial business, and at the same time insure a higher appreciation and greater salary for their services than usually paid for other branches of either mercantile or banking business.

Foreign exchange is a system by which commercial nations discharge their debts to each other. This indebtedness may represent the value of commodities exported to or imported from other countries, money borrowed, loaned, or invested abroad, and the interest or profits on such funds; the cost for transportation of

goods and the commissions for service; the expense incurred in traveling in foreign countries; in fact, any transactions which involve the remitting of money, or anything representing money, from one country to another. These debts have to be paid, either with cash or something equally satisfactory to the creditors. The cost of transmitting gold or currency, and the risk attending the same, while sometimes resorted to, are generally considered too great, and it is to avoid this risk and expense that the system of exchanging debts through the medium of commercial paper is adopted.

One can hardly appreciate the magnitude of the business between the United States and foreign countries which, directly or indirectly, is transacted through the medium of the system we term "foreign exchange," without resorting to actual data in the shape of figures, and we find these figures so large as to be almost incomprehensible.

For the twelve months ending December 31, 1901, the value of the goods or commodities exported from this country to other countries amounted to $1,465,500,000, and during the same period the United States imported from other countries goods to the value of $880,400,000, making a total of exports and imports during the year 1901 of $2,345,900,000—a sum which, if in $1 bills fastened together at their ends, would make a band nearly 260,000 miles long.

The value of the goods we exported exceeded the value of those imported by $585,100,000, which amount of credit in our favor would, had there been no other transactions to offset it, have to be remitted to us from the various foreign countries. But against

this credit in our favor foreign countries charged up to us the amount paid out on letters of credit used by our people to meet expenses in travel abroad—balance due on loans made by our capitalists to float some of the larger enterprises, such as railroad consolidations, the United States Steel Corporation, etc.; so that, notwithstanding there was a large balance due us in the difference between the value of the goods we sold to, and those we purchased from, foreign countries, it was entirely offset, and more too, by other transactions. In fact, during the year 1901 we exported $3,348,000 more gold than we imported. But whether the balance be in our favor or against us, the total amount of the business transacted is practically all handled through the medium of the system we call "foreign exchange," and the importance of a thorough knowledge of the system in its various details is becoming greater each year.

A knowledge of the money of account, or monetary systems, of the various foreign countries is one of the first things necessary to a clear understanding of foreign-exchange transactions.

Paper money, such as government and bank notes and certificates, are, as a rule, intended solely for circulation within the country in which issued, and are not legal tender outside of the country in which they emanate. Of course, paper money is often accepted in small amounts for its full face value in other countries, but it is always optional with the creditor to accept it.

Silver and minor coins are also intended for domestic use, and when accepted in other countries it is at their actual value rather than at their face value. For

illustration: The purchasing power of the silver dollar of the United States within this country is as great for small sums as that of the gold dollar, but in other countries it would be accepted only for its bullion value. The Mexican dollar, which passes for its face value in Mexico, is worth less than fifty cents in this country.

Gold, by virtue of commercial usage and the laws of the various countries of the world, may be said to be the only international money, and its purchasing power is practically the same throughout the civilized world. But bear in mind that the value of gold coins is not always as expressed on their face. In large international transactions the weight of the mass is regarded, and not the number of pieces, and their value depends upon the weight and fineness. By "fineness" is meant pure metal. Nearly all coins contain alloy, or inferior metal which is added to increase their durability.

The value or price of the gold money of account of commercial countries is determined by the weight and fineness of the metal contained therein, which weight and fineness are established by the mint laws of the country issuing the money. It is therefore essential that the standard of weight by which the various moneys of account are established shall be unvarying, and have the highest legal sanction; otherwise there could be no stability of values and no such thing as accurate deductions of pars of exchange. Gold is the only commodity in the world the value of which is established by law.

The price of gold cannot be affected either by an abundance or scarcity of the supply. No matter how

large the supply, our mints, or the Bank of England, will buy it at the price established by law; and although there is no international agreement to maintain the price, the fact that gold is accepted by the chief commercial nations as the one universal measure of values, operates to prevent any attempt to change its valuation. The price of diamonds, which are more valuable than gold, is affected by the supply and demand. Silver, used extensively as money, fluctuates in price like any commodity, the supply and demand governing its value.

As gold shipments between the United States and foreign countries, particularly Europe, are an important factor in foreign-exchange transactions, it may interest you to know how they are handled and the expense attending them.

Whether in coined pieces or bars (bullion), the gold is packed in strong kegs or boxes, securely strapped with hoop iron, and carefully sealed with private seals; the latter to discover if tampered with en route. Space is chartered from the steamship company, as in the case of merchandise, although nearly all large fast steamers have rooms especially constructed for such valuable cargo. At a cost of about 3-16 of 1 per cent., or $1,875 for each million dollars in value, the shipper has it insured against loss. The steamship company charges for carrying the shipment as freight a rate of about ⅛ per cent. of its value, or about $1,250 for each million dollars, making a total cost of about $3,125 per million dollars. As an extra safeguard in case of large shipments, the steamship company details special armed men to guard the room day and night, and sometimes the shipper employs special detectives

in citizen's clothes to watch the passengers on the trip, since it is generally known several days in advance when large shipments of gold are to be made.

In accordance with the United States Mint regulations, a charge of four cents per $100 is made for what are known as commercial bars of gold, which are from 990 to 997 thousandths fine. The shipper has to pay for these bars with gold coin, which is obtainable without charge at the subtreasury in exchange for gold certificates or for legal-tender notes. There is no restriction upon the withdrawals of gold from the subtreasury for export, and the shipper has the option of taking coined pieces, if he prefers, but the loss by abrasion of coined pieces practically equals the cost of 4 cents per $100 charged by the mint for commercial bars, which are put up in that shape to induce exporters to take bars instead of coined pieces, and thus save the government the cost of coinage as well as the transportation of the bullion to the mint.

I shall not undertake to tell you the names and denominations of all the coins or money used in the various foreign countries. It would take too much time, and you would not remember them. I shall simply give you the money of account of the principal countries. By "money of account" we mean the kind of money in which the people keep their accounts, as, for example, we keep our accounts in dollars and cents.

Commencing with North America, we have, in addition to the United States, Canada, Mexico, Central America, and we will include the West Indies islands.

Notwithstanding Canada is a British colony, its trade relations with the United States were too important to admit of the adoption of the complicated British monetary system, and the accounts are kept in dollars and cents as in the United States. No gold is coined, and the United States "gold eagle" ($10) and the British "pound" or "sovereign" are legal tender for all amounts.

Mexico's money of account is the peso, or dollar, of 100 centavos, or cents—worth 40 to 50 cents in our money. Being one of the chief silver-producing countries of the world, the greater part of its coinage is exported to China, the Philippines, and Central and South America, in which countries the Mexican peso, or dollar, is the favorite coin.

The Central American states all have for their unit of money the peso of 100 centavos—not exactly like the Mexican peso, but more like the peso of the South American States, which is similar to the French system—their unit being equal to about 5 francs.

There are many islands comprising the group known as the West Indies islands. Porto Rico, as you know, is owned by the United States, and Cuba was until recently practically controlled by us. At both islands efforts are being made to supplant the Spanish peseta with the American dollar as the money of account. Most of the other islands are possessions or colonies of European countries, and as a rule keep their accounts in the money of their mother-country.

In South America, Uruguay, Paraguay, the Argentine Republic, Columbia, and Chili use the peso of 100 centavos, as in Central America. Brazil uses the milreis of 1,000 reis; Peru, the sol of 10 dineros, each dinero being equal to 10 centavos, or cents; Bolivia

calls its unit the boliviano of 100 centavos, and Ecuador, the sucre of 100 centavos. The value of their units in our money fluctuates, but is approximately 50 cents.

In drawing drafts on Central and South America, and to some extent on Mexico, they are for United States dollars payable in New York, which are, of course, cashed in the money of the country where payable, at the current rate of exchange on New York.

In Africa, Egypt's money of account is the Egyptian pound of 100 piastres, which, although of greater value intrinsically, is worth less commercially than the British pound sterling. Algeria is a French colony, and uses the French system; and the same is true of Madagascar, the third largest island in the world.

Cape Colony, Natal, Sierra Leone, and Zanzibar are British colonies and use the English pound sterling as their unit; and the South African Republic (or Transvaal) and Orange Free State do likewise to facilitate their commerce with adjoining states.

In Oceanica, the islands of Australia, New Zealand, Tasmania, and a portion of Borneo use the British pound sterling by reason of being British colonies; and Java and Sumatra, colonies of Holland, use the gulden or guilder.

Japan's money of account is the yen of 100 sen—which formerly was worth about $1, but in 1898 its value was reduced to about 50 cents.

At the Philippines, although now possessions of the United States, preference is given to the Mexican dollar as formerly, which is worth in our money from 45 to 50 cents, according to the market price for silver.

India or British India, with its population of nearly 225,000,000—three times that of the United States—has for its money of account the rupee of 16 annas, 1 anna being equal to 4 pice and 1 pice equal to 3 pie—not "the kind of pie our mothers used to make." The value of the rupee in our money is about 33 cents. India, being a very poor country, uses coins of very small value, the smallest coin (the pie) being worth about ¼ cent in our money.

Hong Kong is a small island just off the coast of China. Victoria, the capital, and practically the only place there, has a population of nearly 200,000. Most of the trade of China with the rest of the world is done through Victoria, or, as we know it best, Hong Kong. The money of account of Hong Kong is the dollar of 100 cents, but, as in other oriental countries, the Mexican dollar is preferred to the local currency.

China has several kinds of money—the dollar of 100 cents; also a silver coin called tael. The latter varies in value according to the locality and the price of silver in London. But the Mexican dollars constitute the principal circulating medium. In fixing the valuation of the Haikwan tael for the purpose of adjusting the Chinese indemnity, resulting from the recent war there, the plenipotentiaries made the equivalent in American money 74 2-10 cents.

Like India, China is a very poor country, and the coins most extensively used are of very small value. They have a coin called "cash," about the size of our silver quarter (25-cent piece), made of copper and zinc, with a square hole in the center; I suppose you have seen them. One thousand of these are issued on

a string—that's what the hole is for—the lot being equivalent to about $1 in our money, or 1-10 of a cent each.

I have now given you a general idea of the kinds of money in use in the countries of North and South America, Asia, Africa, and the principal islands of the Atlantic and Pacific oceans. We now come to Europe, with which our financial and trade relations are of more importance than all the others combined.

France, Belgium, Switzerland, Italy, Greece, Spain, Roumania, Servia, Bulgaria, Finland, and Austria-Hungary have the same, or very similar, monetary systems, the first five countries named comprising what is known as the "Latin Union countries"—a union formed for the adoption of a uniform monetary system. The other countries adopted the same system, but are not members of the union.

France, Belgium, and Switzerland call their unit the franc, which is divided into 100 centimes. Italy calls the franc, or unit, the lira of 100 centesimi. Greece uses the unit named dracma of 100 lepta; Spain, the peseta of 100 centimos; Roumania, the lei of 100 bani; Servia, the dinar of 100 paras; Bulgaria, the lew of 100 stotinkas; Finland, the finmark of 100 cents; and Austria-Hungary, the crown, or krone, of 100 heller. All these units are practically the same as the franc of France with different names, their actual mint valuation (except Austria-Hungary) being just the same, 19.3 cents.

Germany's money of account is the reichsmark, or mark, as we call it, of 100 pfennige. A mark is worth about 24 cents in our money.

Norway, Sweden, and Denmark, known as the Scandinavian countries, have for their unit the krone, or crown, of 100 öres, its value in our money being about 27 cents.

Holland has the gulden or guilder of 100 cents, worth about 40 cents in our money.

Russia uses for its unit the ruble of 100 kopecks, worth about 52 cents in our money.

Portugal, like Brazil, has for its unit the milreis, equal to 1,000 reis, its value in our money being about $1.08.

Foremost among all nations of the earth in the magnitude of its commerce, its vast colonial possessions and dependencies, and consequently its importance as the chief financial center, Great Britain furnishes the most interesting study of the money of the world. Every school child can tell you the money of account of Great Britain. What possessed them to adopt such a complicated, cumbersome system is a mystery to nearly everyone. The pound sterling is equal to 20 shillings, each shilling being equal to 12 pence, and each pence equal to 4 farthings. Without exception the sovereign is the most universally recognized coin, and, except the Egyptian pound, it is the largest of units of money. Its actual value in our money is about $4.87.

Probably more foreign exchange is drawn in sterling—here and in other countries as well—than in the money of all other countries combined. This is due, however, to the fact that London is the financial center of the world, and exchange on that city is generally acceptable, if not preferred. For the same reason prob-

ably 90 per cent. of all letters of credit issued throughout the world are drawn in English money.

The term "rate of exchange" means the value or the price of the money of one country reckoned in the money of any other country, the value being a fixed rate of exchange, the price a fluctuating rate of exchange.

The rate of exchange quoted between any two countries is for drafts, checks, or bills of exchange, and the price includes, besides the actual equivalent of the standard coin, some allowance for interest according to the tenor of the draft, and a premium which the seller demands for the economy and superior conveniences of his draft or check as compared with a remittance in currency or bullion. This premium, which represents the fluctuation, is more or less according to the amount of exchange in the market for sale and the demand for the same.

There are two kinds of exchange—direct and arbitrated. Direct is when between any two countries; arbitrated, when between two places in different countries through the medium of some other place in another country—or, to express it more clearly, the remitting of money to one country through another country, or the buying of exchange of one country through another.

The occasion for the arbitration of exchange will arise when the rate of exchange here direct upon a country to which you wish to remit is much higher than between that country and another country near by. For illustration: Through the financial columns of our daily papers, or by cabled information direct, the

rate for a check in London on Paris or Berlin, or *vice versa,* is furnished. It generally reads, for example, this way: "Exchange on Paris F. 25.12—Exchange on Berlin M. 20.42." This signifies that you can buy in London, for instance, a check payable in Paris at the rate of 25 francs 12 centimes per pound sterling, or on Berlin at the rate of 20 marks 42 pfennige per pound sterling. Therefore, if you had occasion to remit a large sum to, say, Berlin, and you found you could buy a check on London and have the amount remitted from London to Berlin cheaper than you could remit to Berlin direct, the transaction would be termed "arbitration of exchange." All large banking houses and jobbers of foreign exchange watch the quotation on exchange between countries very closely, and always avail themselves of any advantage to be gained by remitting to one country through another.

The fluctuation in the price of exchange, or, as it is termed, "the rate of exchange," is due to a number of causes. If the value of the goods we exported greatly exceeded the value of the goods we imported during a certain period, the large balance due us from other countries would, if there were no other international transactions to offset them, cause the price of exchange here to be lower, for the reason that there would be less demand for remittance to foreign countries, since it is always the difference between the debits and credits that is remitted. On the other hand, if we owed foreign countries a much greater amount than they owed us, exchange here would be higher by reason of increased demand for it.

But it is not alone our foreign commercial trade that

regulates the price of exchange. The monetary conditions here and abroad may entirely offset other conditions.

When the loaning rate for money here is high, capitalists and bankers will loan their money here, instead of investing in foreign commercial bills, which causes less demand for bills, hence lower rates. If rates for money abroad are high, there will be a greater demand for commercial bills or other exchange on foreign countries, for the purpose of getting their money to those countries to take advantage of such high rates, thereby causing higher rates. If the rates for money abroad are lower than here, as was the case during nearly all of the year 1901, our capitalists and bankers would borrow money in their markets for investment here, thus increasing our indebtedness to foreign countries, and when such loans became due there would be an increased demand for exchange to pay these, resulting in higher rates.

The discount rates at London, Paris, Berlin, and other European centers very materially affect the buying and selling price for commercial bills drawn against commodities exported. These discount rates are the rate per cent. at which commercial paper of the different classes may be discounted—that is, the allowance made for cashing or taking up the paper before maturity or before due and payable. These discount rates fluctuate according to the conditions prevailing, as does the rate of exchange. When discount rates abroad are high, the rate for commercial bills here will be lower, and when low abroad, the rate for commercial bills here will be higher.

Under normal conditions, the rates for foreign exchange fluctuate between what are termed gold-exporting or gold-importing points, which means the actual cost of the gold plus the cost of transporting it from one point to another. For example: If you wished to remit, say, to London the equivalent of £50,000 (or approximately $250,000), and you found that the cost of the gold coin or bullion and the expense of freight, insurance, commissions, etc., would be considerably less than the cost of a draft or check for the amount on London, then you would ship gold in preference. If the cost were equal or greater for shipping gold, then you would remit by check, as it would be more convenient and less risk. Therefore the rates naturally do not go much above or much below the gold points.

When the rate for demand sterling exchange gets down to, say, $4.83¾ to $4.84 per pound, it is cheaper to import gold. If such exchange reaches as high as $4.88¼ to $4.88½ per pound, then gold can be exported equally cheaply.

But notwithstanding these various conditions which affect the market price for foreign exchange, it is the supply and demand that regulate the price, as in the case of wheat, corn, or any commodity.

"Par of exchange" means equal of exchange. There is a "mint par of exchange," and also what might be termed a "commercial par of exchange."

The "mint par of exchange" between the United States and foreign countries is the actual value in our money of the pure metal contained in the coins representing the units of money of the various countries.

The director of the United States Mint is required at stated periods in each year to proclaim the values of these coins or units in our money for the purpose of computing the worth of importations of goods and also the amount of customs duties assessable thereon. The value of gold coins, as fixed by the director of the mint, rarely ever changes, since the weight and fineness of the gold units of countries are fixed by law—in the United States by act of Congress, in Great Britain by act of Parliament.

The mint par of exchange of the English pound or sovereign in our money is $4.8665; of the French franc and the franc of the Latin Union countries, 19.3 cents; of the German mark, 23.8 cents; of the Scandinavian krone, 26.8 cents; and of the Holland gulden or guilder, 40.2 cents; and for many years it has been the same. While these values as furnished are not exactly correct, they are sufficiently accurate to serve the purpose intended, and are accepted for all computations at the custom houses.

To determine the actual mint par of exchange between any two countries, it is necessary only to divide the weight of the pure gold in the gold unit of the one country by the weight of the pure gold in the coin of the other country. The mint par of exchange between the United States and countries having silver monetary units is arrived at in the same way, but as the price of silver fluctuates, the value of silver coins frequently changes.

As an illustration of how the pars of exchange are arrived at, we will take for example the mint par of exchange between the United States and Great Britain.

Our gold dollar (which is our unit or money of account) weighs gross 25.8 troy grains and is 9-10 fine, 1-10 alloy being allowed to increase its durability, which, if deducted, leaves 23.22 troy grains of pure gold. The sovereign contains gross 123.274478 troy grains, and is 11-12 fine, which leaves the pure gold in the sovereign 113.001603 troy grains, which, if divided by 23.22, the pure gold in the United States dollar, gives $4.866560, the mint par of exchange.

If you divide the value of the sovereign ($4.8665) by 20 (there being 20 shillings to the pound), it will give you the actual value of the shilling in our money, or if you divide it by 240, the number of pence to the pound, it will give you the value of the penny in our money (a fraction over 2 cents).

Now, as to the commercial par of exchange, if you add to the mint par of exchange between two countries the cost of transferring the coin or bullion, which involves freight charges, insurance, interest, commissions, and sometimes discounts, you will arrive at what would be termed, under normal conditions, the "commercial par of exchange," or the amount necessary to discharge a debt of a merchant in one country to a merchant in another country.

In further illustration of the commercial par of exchange, if the United States owed England exactly the same amount that England owed us, the debts between these two countries could be paid without the intervention of money, and the commercial price of exchange would be at par. If, however, we owed England a greater amount than it owed us, exchange here would be higher, and in England lower, and *vice versa.*

In other words, exchange in the United States would be at a premium, and in England at a discount, the premium in one case being about equal to the discount in the other.

Quotations for foreign exchange, such as checks, drafts, commercial bills, etc., are rarely understood except by those familiar with the business. In quoting the rate of exchange for drafts, checks, etc., on countries other than France, Germany, and sometimes Italy, the rate quoted is per single unit, that is, so much in our money per pound sterling on England, krone on Norway, Sweden, and Denmark, ruble on Russia, etc. Exchange on France and Germany, when quoted by dealers at smaller places, would be the same—so much per single franc or mark; but in the larger cities it is the custom, when quoting rates for francs, to quote the number of francs and centimes that will be allowed per $1, as, for example, 5.15⅝—meaning that for each $1 you would be allowed 5 francs 15⅝ centimes. On Germany the quotation would be for 4 marks instead of 1; for example, 95 5-16—meaning that for each 4 marks you would have to pay 95 5-16 cents. The allowance of ⅝ of a centime per $1, considering that one whole centime is worth only 1-5 of a cent in our money, and a fraction like 5-16 of a cent in our money on 4 marks, no doubt seems to you like a very small item, but on a transaction of 100,000 francs (about $19,400 in our money) ⅝ of a centime per dollar would make a difference of over $28, and 5-16 of a cent per 4 marks on 100,000 marks (about $24,800) would be a difference of over $78, or over $15 on each 1-16 of a cent.

One peculiarity in the French quotations is that the rate is always advanced or lowered by ⅝ of a centime; for illustration, the next lower rate to 5.15 would be 5.15⅝, then 5.16¼, 5.16⅞, 5.17½, etc., there being just ⅝ between each quotation. Bear in mind, the greater the number of francs and centimes allowed per dollar, the lower would be the rate, since, as the quotation is per $1, the more francs you would receive for your money. One reason assigned for this method of quoting the French franc, which is the reverse of that in other kinds of exchange, is that ⅝ of a centime is equivalent to ⅛ of 1 per cent. in the pound sterling, and as most of the French exchange was formerly covered or paid through English exchange, this method served a convenience in figuring. The other reason, which is given by the *Financier* of New York, is that, as there are 5 francs to the dollar, ⅛ of 1 per cent. on 1 franc would call for ⅝ of 1 per cent. on 5 francs, the equivalent of $1.

But these quotations on francs by ⅝ of a centime, though they served every purpose a few years ago, are not now sufficiently close to meet the competition of the present day, and are supplemented with fractional quotations, such as 5.15⅝ — 1-32, or 5.15⅝ — 1-16, or 5.15⅝ + 1-32, etc. These plus or minus fractions do not apply directly to the rate, but mean 1-32, 1-16, 3-32, etc., of 1 per cent. plus or minus the equivalent amount in American money, which is added or deducted as the case may be.

In a publication entitled *Foreign Exchange,* recently issued by myself, furnishing conversion tables for foreign-exchange transactions, I have undertaken to

have adopted a method for quoting on French exchange that would do away with those confusing fractional quotations, by supplying conversion tables for francs, the equivalent of $1 by eighths of a centime. For example: instead of jumping from 5.15 to 5.15⅝, which would now be the next lower quotation, the tables in this book are for 5.15, 5.15⅛, 5.15¼, 5.15⅜, 5.15½, and then 5.15⅝, which practically serve the same purpose, and avoid the complicated figuring of the fractions, plus or minus 1-32, 1-16, or 3-32, etc., of 1 per cent., mentioned; and I look for its general adoption in the near future.

Quotations for German exchange, where quoted for 4 marks instead of a single mark, are also supplemented by the plus or minus fractional quotations; as, for example, if 95 5-16 per 4 marks was thought a little too high, it will be quoted 95 5-16 minus 1-32 of 1 per cent., which on a transaction of 100,000 marks would make a difference of about $7.50.

In large transactions the quotations on English exchange (which are generally confined to eighths of a cent per pound) are often supplemented with the quotation plus 1.00, which means $1 additional will be charged on each 1,000 pounds, making a difference of 10 points in the rate. That is, a quotation of 4.87¼ plus 1.00 would be $4,8735, and it is not unusual in very large transactions to advance or lower the rate by five hundredths of a cent per pound, such as 4.87—4.8705—4.8710, 4.8715, etc., each five hundredths of a cent per pound making a difference of $5 on each 10,000 pounds, or $250 on a transaction of 500,000 pounds (nearly $2,500,000 in our money), often made by large financial institutions in a single day.

I have here a clipping from the Chicago *Daily Tribune,* quoting the rates for "foreign exchange." Under the heading "Foreign Exchange Market" it starts in by saying: "Foreign exchange closed steady at the following rates." "Steady" means a fair demand and prices likely to remain as they are. "Firm" would mean good demand, with prices tending upward; "strong," a large demand, with prices certain to go higher. "Dull" or "weak" would, of course, mean very little or no demand, with prices tending lower.

Under the head of "selling" rates it gives:

Cable transfers, London	4.88
Checks, London	4.87½
Checks, Paris	5.16¼ plus 1-32
Checks, Berlin	0.95 7-16
Checks, Holland	0.40¼

"Selling rates," in this case, mean the prices that were charged customers who wished to remit abroad.

The first item, "cable transfers," is where amount of money desired to be paid abroad is deposited here, and the bank or concern with which you are transacting the business cables its correspondent abroad to pay the amount to the person at the address you designate. Of course, it would be necessary for those making such transfers to have funds or credit abroad for such purpose. When it is desired to have money paid at interior places, the cablegram will be sent to the nearest city at which the bank or concern here has funds, and it will be forwarded by mail from there, causing a delay of perhaps only a few hours. Ordinarily, within one or two hours from the time you deposit the money here it will be paid to the person abroad whom you designate.

The quotations for checks London, checks Paris, and checks Berlin are the rates at which they would have sold you a demand check or draft payable at those particular cities. If you had wanted a check payable at some other point in Great Britain, France, or Germany, they undoubtedly would have charged you a higher rate, since their balances are kept only at principal trade centers, and their arrangements for payment of their paper at interior or other points are that the bank correspondents there will honor their paper and reimburse themselves by drawing upon the trade centers for the amount plus their commission for cashing, hence adding to the cost of performing the service.

The next item is "checks Holland 40¼." This means they would charge for a check or draft on any point in Holland at the rate of 40¼ cents per gulden or guilder—the money of that country.

Following the above there appears in this clipping the heading "Buying Rates," which means the rates at which the banks purchased the various classes of commercial paper named. The quotations are as follows:

60 days	London bankers	4.84¼
60 days	London documentary	4.84½
3 days	Antwerp	5.18⅛ less 1-32
3 days	Hamburg	0.95¼ plus 1-32
60 days	Holland	0.39 15-16

The first quotation, "60 days London bankers 4.84¼," is for drafts drawn by bankers payable sixty days after sight (meaning after acceptance abroad) against their account in a bank upon which draft is drawn. The banker issuing such draft has 60 days (if necessary) in which to place funds abroad to meet payment of this draft; therefore a bank will often sell its

sixty-day draft with the belief that it will be able to purchase and place the amount abroad to meet the same before draft is due, at a lower rate than at which it sold, and thus make a profit. There are other cases where a bank will sell its sixty-day draft on the market to obtain the use of the money for that period.

The next item, "60 days London documentary 4.84½," is what is known as a foreign commercial bill of exchange, which I will explain more fully later. The documents referred to are the bills of lading and the insurance certificates, representing a shipment of goods abroad. The draft is drawn payable sixty days after sight, which is the time credit extended to purchaser by the seller.

The three-day quotations mentioned on Antwerp and Hamburg are for drafts payable three days after sight. The custom of drawing drafts three days after sight on points in European countries outside of Great Britain is because no days of grace are allowed on the continent as in Great Britain, and the three days are granted to insure payment being made, and thus avoid "protest fees," which often are very exorbitant.

The sixty-day Holland bills are issued and paid under practically the same conditions as the sixty-day London bankers just mentioned, although drawn against commodities exported. They are what is termed "clean bills," by reason of there being no documents attached.

I have also clipped from the paper the following items which pertain to foreign exchange transactions: Under the head of "Money Markets of the World" it reads: "Discounts at London, 2¾ per cent.; Paris,

2 7-16 per cent.; Berlin, 1⅝ per cent." Foreign discount rates mean the rate per cent. charged or allowed on drafts discounted or paid before due. These particular rates mentioned apply to drafts drawn on bankers.

Here is also another newspaper clipping: "Sterling exchange—posted rates 4.88, actual rates 4.87¼, documentary rates 4.84." Posted, or nominal, rates are those posted daily on bulletins of leading New York dealers in exchange for use of the general public, and apply more particularly to smaller sums. Actual rates are inside terms made to brokers or large buyers for large sums. Documentary rates are for commercial bills of exchange.

Here is another newspaper quotation, which, while not applying directly to foreign exchange, materially affects its rates in the western market: "New York exchange—30 cents discount before clearings, 40 cents discount after clearings." The expressions "before" and "after clearings" mean before or after the meeting of the bank clearing-house, a meeting held each day about 11 a. m. by representatives of the different banks to exchange debits and credits with each other. "New York exchange" means checks payable by a bank in New York. Thirty cents discount in this case would mean that New York exchange, in sales between banks (not as a rule with the public), would be sold at a discount of 30 cents for each $1,000. If New York exchange were quoted at a premium of 30 cents, they would charge 30 cents additional per $1,000. The reason why the rates for New York exchange affect the rates for foreign exchange in the West is that the rates

in the West and elsewhere in the United States are based on—or I might say controlled by—the rates in New York, because New York is the principal buying market. Therefore if New York exchange here is at a discount, on large transactions banks would sell you a draft on London or other foreign city at the rate of 30 cents per $1,000, less than you could buy it for in New York; or, if at a premium, the rate would be that much per $1,000 higher than New York rates, providing of course you paid in cash or local funds.

The basis of a foreign bill of exchange is, as its name implies, a commercial transaction of international character, which consists in the purchase of goods or commodities in one country for export to another country. The draft represents the money value of the goods which is due the exporter. The bill of lading is the contract between the transportation company and the shipper for the carrying of the goods, and also serves as the order for their delivery. The insurance certificate is the certification of the marine insurance company of reimbursement in case goods are lost by fire or accident while en route on the ocean. These three documents—the draft, bill of lading, and insurance certificate—comprise what is termed a foreign commercial bill of exchange. They are almost invariably issued in duplicate for fear one set may be lost in its transmission abroad by mail, one of each set being marked "original," the other "duplicate;" or sometimes one of the drafts will read "first of exchange," the other "second of exchange." Foreign commercial bills of exchange are also known as "documentary bills of exchange," by reason of the bill of lading and in-

surance certificate accompanying the draft. It is customary to send the originals of the three documents by first steamers, the duplicates or seconds by following steamer. If the original set is lost, the duplicate will serve the same purpose.

Trade between countries may be said to be conducted in a manner somewhat similar to that employed here between cities or towns, except that the method of payment or reimbursement to the shipper necessarily differs by reason of greater distance, the difference in kind of money used, and commercial customs in the two countries. To obtain payment for goods shipped to a foreign country which perhaps would not arrive at their destination for several weeks and possibly months, according to distance, and whether by fast or slow steamer, to say nothing of the fact that to some countries steamers only leave our ports semi-monthly or monthly, it is the usual custom of the shipper, whom we term the exporter, to sell his commercial bill of exchange against the shipment in advance to the highest bidder; and he rarely experiences any difficulty in finding a ready purchaser.

Our exporters, in competing with foreign manufacturers, must take into consideration cost of transportation, insurance on goods, customs duties, difference in value of money, and the probable price at which they can discount or sell their commercial bill against the same. Time credit must also be extended to the buyer. If our exporters had to wait for payment until the maturity of their bills, it would mean the tying up of a large amount of capital and possibly prevent their competing successfully.

The process by which a foreign commercial bill of exchange drawn against commodities exported is created and handled, and reaches its termination, may best be illustrated by an actual transaction, and I have obtained for such purpose exact copies of a commercial bill of exchange drawn against a shipment of flour made by a leading exporter—flour being one of our chief exportable commodities.

The shipment of flour in question, destined to Liverpool, England, was delivered to the Soo freight line at Minneapolis, operating over the Minneapolis, St. Paul & Sault Ste. Marie and Canadian Pacific Railroads, and a through bill of lading in duplicate was obtained. This through bill of lading is a form of contract, issued by special arrangements with connecting ocean steamship lines, by the terms of which it is agreed, under conditions printed thereon, to transport the shipment through to the destination at the foreign port (Liverpool). It states the number of packages, how they are marked, their contents, the particular grade or brand of flour, and the name and location of the party for whom the goods are intended. It is negotiable only by indorsement of the exporter.

Upon presentation of this evidence of shipment, a marine insurance company has issued a certificate of insurance, under the terms of which it agrees to reimburse the owner of the goods in case of the loss of the shipment by fire or accident while en route on the ocean. This shipment, as is the usual custom, is insured for about 10 per cent. in excess of its billed value.

The exporter then attaches to these documents a draft for the amount for which the flour was sold,

namely, £457 12s. 10d. Had this shipment been destined to a point in Germany, the draft would have been drawn in marks; if to France, in francs; etc.; usually in the money of the country where it is going; but quite often it will be drawn in English money, although going to some other country, by reason of English exchange being preferred.

In this case the exporter agreed to allow the buyer sixty days' time in which to pay the draft, after its presentation. The draft reads "60 days after sight of this first of exchange (second unpaid), pay to the order of ourselves 457 pounds 12 shillings and 10 pence, against Soo line, through B.L. No. B. 1548, dated May 16, 1901, for 2,000 sacks of flour branded Dakota," and is signed Northwestern Consolidated Milling Co., by H. E. Kent, cashier, who are termed the drawers. In the left corner it reads: "To James Corwith & Co., Liverpool, Eng." They are the buyers, or, as we term them, the drawees.

Now, these three documents, drawn to the order of the exporters (Northwestern Consolidated Milling Co.), comprise a commercial bill of exchange.

Upon the same day that these documents were issued, and practically before the flour has started on its long journey, the exporters offered this bill of exchange for sale. It was sold to the Security Bank of Minneapolis (that being highest bidder) at the rate of $4.84 per pound, who in turn resold it to the American Express Co. at $4.84⅛ per pound. The indorsements on the back of the draft read:

Northwestern Consolidated Milling Co., H. E. Kent, Treasurer.

Security Bank of Minnesota, Thos. F. Hurley, Cashier.

Pay to the order of the National Provincial Bank, Liverpool. American Express Co., By Jas. F. Fargo, Treasurer.

The latter indorsement shows the papers to have been sent to Liverpool for collection. The bank at Liverpool notified Corwith & Co. to call and accept the draft, which they did, by writing the word "accepted" and the date over their signature.

About fifteen days afterward the flour arrived by slow steamer, and, being in immediate need of it, Corwith & Co., in order to obtain the bill of lading, had to pay the draft; the instructions stamped on same being: "Surrender documents upon payment only."

Now, as Corwith & Co. paid this draft forty-five days before it was due, the bank, as is customary, allowed them the prevailing rate of discount applicable to that class of bills, which was 2 per cent. (or £1 3s. 5d.). The difference, £456 7s. 5d., less cost of revenue stamps, was placed to the credit of the American Express Co. by the bank which closed the transaction.

Had the instructions on draft read "Surrender documents upon acceptance of draft," the bill of lading would have been delivered when draft was accepted, thus enabling Corwith & Co. to obtain goods at once and pay draft sixty days afterward if they desired.

The method used in determining what this commercial bill was worth when buying it here was based upon the following:

1. What demand exchange upon Liverpool could be sold for.

2. The cost of revenue stamps to be affixed when draft was accepted abroad.

3. The interest for the number of days for which draft was drawn, plus three days' grace, at the rate per cent. bill could be discounted.

For illustration:

$4.8775	Demand rate on Liverpool.
0.00244	Cost of revenue stamp (1-20 of 1 per cent. of rate or 1 shilling per 100 pounds).
$4.87506	
0.01676	Interest 63 days 2 per cent. (discount rate).
$4.85830	Parity or cost per pound at maturity or if discounted.
4.84125	Rate per pound at which purchased.
$0.01705	Profit per pound.

Or $7.78 on £457 12s. 10d.

The buying of foreign commercial bills of exchange is the principal medium of bankers and foreign-exchange dealers in placing funds to their credit in banks abroad against which they issue checks, drafts, letters of credit, etc. It is the foundation of most of our foreign-exchange transactions. It is the principal source of profit in the business. It enables manufacturers to sell their goods abroad for cash in advance.

Foreign bills of exchange vary as to conditions of payments abroad. If conditions of sale between buyer and seller of the goods were that goods were to be paid for upon delivery, the instructions accompanying the bill would say "documents for payment" (expressed d. p.), meaning not to deliver the bill of lading (which would enable drawee to get goods) until draft had been paid.

If instructions said "documents for acceptance" (expressed d. a.), it would mean that bill of lading

could be delivered when draft was accepted, thus enabling drawee to obtain goods at once and pay draft any time within sixty-three days (if a sixty-day bill).

The buying of commercial bills of exchange can be safely undertaken only by those thoroughly familiar with that business. It is practically equivalent to loaning money upon security you have not seen. If the drawee of the bill has unquestionable responsibility, that of course eliminates the principal risk of loss; but if great care is not exercised in examining bills purchased, a slight imperfection or error might cause a long delay in adjusting the error, thereby causing loss of interest. If through a misunderstanding or for other cause goods are not accepted, they have to be sold to the best advantage for the account of the owner of the bill, and the proceeds of the sale are applied toward payment of the draft. If there is a deficiency, it is collected of the drawer of the bill—the exporter. The buyers of commercial bills should know the market value of the goods exported and the financial standing of the drawer or exporter; should see that the bill of lading is correctly dated, corresponds with the shipment made, is duly signed by the agent or proper official of the railway or freight line; that it corresponds with the insurance certificate in the various particulars; that, if more than two copies were issued, he has them all; that there are no printed or stamped conditions thereon that would be likely to render it valueless under possible emergencies. If goods are perishable, see that they are routed by fast freight and fast steamers. If bill of lading only covers shipment to the seaport, as is sometimes the case when shipped

from small inland places where through bills of lading are unobtainable, arrangements must be made through your own agent to have same exchanged for ocean bill of lading at seaport. Any error or incompleteness of the documents will cause a delay in payment or expense for cablegrams to adjust them.

It is the custom of large buyers of foreign commercial bills of exchange to exact of exporters what is termed a "hypothecation certificate." This certificate, after describing the nature of the shipment and the documents in question, states in effect that the bill of lading is lodged as collateral security for the acceptance and payment of the draft; that in case the drawee declines to accept the draft, or it is not paid at maturity, the owner of the bill is authorized to place the property described in the hands of brokers for sale for account of whom it may concern, and apply the proceeds toward payment of the draft and expenses incurred; and that in case of a deficiency the seller agrees to pay amount on demand. Sometimes exporters give a general hypothecation certificate to apply to any and all bills of exchange purchased of them.

Certificates of insurance on shipments exported are usually for a sum of from 10 to 20 per cent. in excess of the stated value of the goods. They should be carefully examined to see that there is no clause which would render insurance void in event of the shipment not going forward at a specified period, or that it would expire before arriving time of the goods in case of delay or by reason of any of the possible emergencies likely to arise.

The buyer of foreign commercial bills of exchange

must be familiar with the revenue laws and commercial customs of all the foreign countries, as well as the various rates of discount upon the several classes of paper as they change from day to day.

You should always bear in mind that a different rate for discount applies to the different classes of bills. For instance, on documentary bills where documents are for payment, the discount or rebate rate is 1 per cent. below the Bank of England official minimum discount rate. If drawn on firms (not bankers) and documents are for acceptance, the discount rate would be ¼ of 1 per cent. above the private discount rate for bankers' bills.

If drawn on bankers, whether documentary or otherwise (which are always for acceptance), the discount rate would be the private rate of discount, which fluctuates according to demand and supply of such bills; and in case of large transactions it is customary for buyers of such bills here to cable their correspondents abroad for a discount rate to apply on bills to arrive by next mail or for a stipulated period before buying, in order that they may know exactly at what rate the bills can be discounted upon their arrival. Without such previous arrangement the discount rate might change materially and result in loss upon the transaction.

The Bank of England official minimum discount rate is fixed by the directors of the Bank of England at their meetings upon Thursday of each week, and their decision usually appears in the financial columns of our daily papers reading thus: "Bank of England minimum discount rate unchanged," or "the Bank of

England increased (or reduced) its minimum discount rate to 3 per cent.;" etc.

The private discount rate is the rate at which private banks (meaning all those in Great Britain other than the Bank of England) will discount bills of exchange for account of the owners or last indorsers, and this discount is governed by the Bank of England discount rate, and also by the supply of bills in the market for discount, but, except under unusual conditions, the private discount rate will always be about ¼ of 1 per cent. below the Bank of England official minimum discount rate.

What are known as "rebate rates" apply only to time commercial bills of exchange drawn on firms where documents are for payment; that is, where bill of lading is delivered only upon payment of the draft. This rebate is an allowance made to the payee or drawee from the face amount of the draft, if paid before maturity, or before due, and such rebate is 1 per cent. below the Bank of England official minimum discount rate.

Theoretically the Bank of England controls the discount market in London. This control is sought to be maintained through the official rate of discount at the bank, which is advanced when its stock of gold bullion is being largely drawn upon for export to the United States or European countries. If conditions prevail to make it inadvisable to raise the bank rate, a higher price for gold will be charged; or if it finds difficulty in controlling the discount rate, it will create a demand for discounts by borrowing on its security, thereby increasing the demands for discounts.

Unlike the Bank of England, which undertakes to control the stock of gold by advancing the discount rates, the Bank of France protects its stock of gold by increasing the price of gold when withdrawal of a large amount is threatened. The official discount rate of the Bank of France, which controls the market rate, rarely changes except in case of financial or political crises.

There are certain classes of commercial bills which, unless special care is taken, are regarded unsafe. In the case of cotton, on account of the different grades and the fact that there is so great a difference in the price of the different grades, and its being so easy to substitute one grade for another, the bills against shipments should be purchased only of well-known and responsible shippers or indorsers.

Grain shipments are all right, providing the grain inspector at the shipping point is of good reputation; otherwise he might inspect as No. 2 what was billed as No. 1.

Perishable goods are always more or less risky, on account of the danger of delay and of the goods spoiling. You should see that perishable goods are sent by fast freight lines and fast steamers.

Pianos, organs, musical instruments, and such goods have imaginary values, and could rarely be sold at the price at which billed.

"Banker's reimburse bills" is where drafts are drawn against a shipment exported, upon a banker, the documents being for acceptance. When buying such bills you should keep a record showing names of

indorsers and keep close watch of the drawer or shipper until the bill is paid. The shipper should be responsible, and, if buying a considerable amount of such bills on the same drawee, you should ascertain through your correspondent abroad the responsibility of the drawee, and be sure you do not buy more bills against a single drawee than his ordinary business requirements would indicate he needed.

Banks selling commercial bills of exchange (documentary) sometimes stamp them, for example, "In case of need with the Bank of Scotland, London," or some other bank. This is done to avoid charge of intermediate banks for indorsing or protesting drafts, which charge is usually very exorbitant. When so stamped, it is a notice to all holders of the draft they may call upon the bank named, if the draft is not promptly accepted or honored, for relief; therefore there is no necessity for protesting. The bank mentioned will, by previous arrangement, always honor such drafts and charge to the account of the bank indorsing such notation thereon.

"Clean bills" of exchange are those having no bill of lading attached, although they may have attached the insurance certificate and an invoice of shipment. If these clean bills are drawn upon firms, they are subject to a discount rate of ¼ of 1 per cent. above the private discount rate of the day; but if drawn upon bankers, they will be discounted at the private discount rate.

Commercial bills of exchange drawn by exporters without documents are generally upon their own house or branch abroad, and are against funds which have

accumulated to their credit from payments for shipments previously made. Exporters before selling their own bills of this kind usually wait until the rates for exchange here are high. Such bills are discountable.

Commercial bills of exchange drawn upon bankers are always for acceptance, unless otherwise specified, and the discount rate applying to such bills is the private discount rate of the day.

Documentary commercial bills of exchange drawn upon firms or banks where documents are for payment cannot be discounted upon the market, as in the case of such bills where documents are for acceptance, for the reason that banks abroad to which bills are sent for collection will not undertake to discount commercial bills unless they are what is called "clean" bills—that is, those having no documents or those which permit the documents to be delivered when the draft is accepted by the drawee.

A documentary or commercial bill of exchange, accompanied by instructions from the exporter or drawer, to deliver documents (bill of lading, etc.) only upon payment of the draft by the importer or drawee, which are drawn upon a firm, are subject to a discount rate of 1 per cent. below the Bank of England official minimum discount rate. If the instructions are to deliver documents upon acceptance of the draft, the same rate of discount applies, unless the drawee is of very good financial standing, in which case the bill may be discounted by the holder (bank) at ¼ of 1 per cent. above the private discount rate of the day.

Drafts drawn in the United States payable in foreign countries are subject to the revenue laws of such

foreign countries, and the cost of stamps so affixed abroad must be paid by the holder of the bills, who in turn generally charges to the bank or banker from whom they receive the same for collection. The amount of revenue varies according to the country. The following shows the cost on other than demand drafts in the principal foreign countries:

Great Britain: 1s. per £100 or fraction thereof, or 1-20 of 1 per cent. of rate.

Germany: 50 pfennigs per 1,000 marks or fraction thereof, or 1-20 of 1 per cent. of rate.

France: 50 centimes per 1,000 francs or fraction thereof, or 1-20 of 1 per cent. of rate.

Belgium: 50 centimes per 1,000 francs or fraction thereof, or 1-20 of 1 per cent. of rate.

Holland: 50 cents per 1,000 gulden or fraction thereof, or 1-20 of 1 per cent. of rate.

Norway, Sweden, and Denmark: 50 öres per 1,000 kroner or fraction thereof, or 1-20 of 1 per cent. of rate.

Italy: ⅛ per cent. of rate, or $1.13 per $1,000.

Russia: ¼ per cent. of rate, or $1.25 per $1,000.

Austria-Hungary: ⅛ per cent. of rate, or $1.13 per $1,000.

Switzerland varies at different places—some places have none.

The cost of revenue stamps required to be affixed to commercial bills in Great Britain at the time of acceptance of draft is 1s. for each £100 or fraction of £100, which is equivalent to ½ per mille, or ½ per cent. per £1,000, or 1-20 of 1 per cent. of the rate, which latter, expressed decimally, when the rate is $4.83 per pound, would be 0.00244 (or 488 divided by 1-20 of 1 per cent). Where the amount of bills is small, say £1,000 and under, it is safe to deduct ¼ cent per pound to cover cost of revenue stamps.

On short bills—five days' sight or less—only one-penny stamps (2 cents) are required.

Banks abroad are noted for charging for every item possible in connection with every transaction handled —such items as postage on letters sent to you during a certain period, cost of cablegrams, check-books, envelopes, stationery, and often a lump sum for items that may have been overlooked. For collecting commercial bills of exchange they will usually charge, in England, about 1-20 of 1 per cent., or 1 shilling per cent.; in France, 1-16 per cent.; in Germany, 1-20 per cent. in the larger places and from 1-16 to ⅛ per cent. in the smaller places.

Interest at thirty, sixty, or ninety days, with three days' grace added (as allowed throughout Great Britain), can easily be arrived at by using printed tables furnished free by some of the leading foreign-exchange bankers, which give the proper decimal of a pound to deduct for interest and revenue stamp at the various rates. These printed tables also give the same information for figuring German and French bills of exchange.

Exchange transactions become more complicated when one country or place, as is often the case, discharges its debts through another country by means of bills of exchange drawn upon a third country or place; as, for instance, a merchant in Chicago importing goods from China would pay the exporter in China with a check upon London, for the reason that such check would be more desirable to the shipper in China, since the demand for exchange in China is greater upon London than upon the United States.

When in any market the demand for exchange on a certain country or place is greater than the supply,

the deficiency is usually supplemented by bills on other countries having a more favorable exchange with the latter.

In the East Indies those who ship to America usually draw upon London instead of America. In New Orleans, exporters of cotton, etc., to Russia, draw upon London instead of St. Petersburg. This is because England does more business with those countries than America; besides, London is regarded as the greatest money center, and exchange upon that city is usually more favorable and can be used to better advantage.

Importers in Germany will not accept drafts drawn against importations until the duplicate documents (duplicate draft, bill of lading, etc.) are presented, and, in order to have the original draft accepted immediately upon its arrival, banks in this country when forwarding such bills for acceptance and collection will attach to the original draft a memorandum agreement to the effect that the duplicate bill of lading is in their possession, and their correspondents (banks) are requested to guarantee the acceptors (importers) that the duplicate documents will be delivered to them as soon as received, which guarantee also gives the number and amount of draft, the name of drawer, and the signature of a proper official of the bank or financial institution forwarding the same.

The volume of transactions in French, German, and other continental exchange is quite small compared with that of sterling exchange. The reason for this is that most banks have accounts or balances only at London, and where balances are kept in other European cities they are usually small as compared with

their London account. Therefore, in making remittances to Paris, Berlin, or other cities on the continent, it is most generally effected by transferring the funds to those cities from London, which can generally be handled very satisfactorily, by reason of most large European banks having branches in London. It is customary, however, for banks, before transferring funds from their London accounts, to carefully figure out the difference in cost between a remittance direct from here to the city where it is desired to place the funds and the expense of transferring it from London. This can easily be determined by ascertaining the rate of exchange between London and the point referred to.

A "crossed sterling check" is one payable either to bearer or order, having the name of a banker, or two parallel lines and the abbreviation "& Co.," written or printed across the face, thus: "═══════ & Co." The effect is to direct the bank upon which it is drawn to pay the check only when coming to it through some other bank. It is intended as an additional safeguard against wrong payment.

In most foreign countries it is the custom of bankers and others in the cashing of checks, whether drawn payable to order or bearer, to pay to the person presenting the same, and under the laws existing in these countries the paying bank or banker would not be held liable for wrong payment. As a reason for this seemingly risky method, it is claimed that on account of the very severe penalty imposed for forgery under their laws, the requiring of strict personal identification, as exacted by banks in the United States, is found unnecessary.

As an additional precaution against wrong payment, the laws of Great Britain require that where a check is crossed, as explained above, while not requiring personal identification, it must be cashed through some bank other than the one upon which it is drawn.

Notwithstanding the requirements under the laws, we presume a reasonable amount of care is exercised by banks to prevent losses by incorrect payment, and we are informed that in some countries a stranger presenting a check drawn to his order is required to make affidavit that he is the person named, for which affidavit the paying bank exacts a small fee.

FIRE INSURANCE.

A. F. DEAN, ASSISTANT MANAGER, WESTERN DEPARTMENT, SPRINGFIELD FIRE AND MARINE INSURANCE CO.

In the good old stagecoach days, before humanity began to keep step to the ragtime rhythm of steam and electricity, when gentlemen deemed it vulgar to exhibit haste, and youth was given time to be youth, it was a wholesome custom with German students and apprentices, before settling down to the serious duties of life, to spend a *Wanderjahr* in looking about their fatherland.

We live in a land and an age of accelerated motion, in which economics demands from our young men "prompt returns" and the largest amount of usufruct from the smallest investment in preliminary training. The American alumnus seldom has a *Wanderjahr*. He is lassoed fresh from the campus, bridled, saddled, and put to work under the merciless spur of necessity. It must be admitted that a good constitution and other inherited traits enable him to do creditable work, but he might do better work after a year of observation and meditation, and possibly escape the lifelong rasping of an uncongenial occupation had he the opportunity to peep into our busy hives of modern activities long enough to get some definite idea of their relations, scope, and purpose before choosing his vocation.

But it is useless to speculate over the impossible. The trail of the electric wire and railway track is

over us all, and the *Wanderjahr,* like many things good and bad, has been relegated to the limbo of the past. In its lieu your provident Alma Mater has arranged to bring before you through a series of lectures a portrayal of the major industries of your fatherland which you cannot spend a *Wanderjahr* in seeing—a portrayal of things grown so intricate in their modern expansion that the mere seeing without explanation would not give you understanding.

It is my duty today to tell you about fire insurance: why it is, what it is, what it does, and how it does it.

An adjuster of fire losses once told an inquisitive stranger, who was anxious to know his business, that he was engaged in buying ashes. While this does not define what Kant would call "the thing itself" of fire insurance, it does, in a way, define its immediate manifestation, for fire insurance, as the public understands it, is a world-wide dealer in ashes; and one of the most extensive transactions on record was negotiated in this city when it bought an ash heap bounded on the north by Lincoln Park and on the south by Mrs. O'Leary's barn. If you ask, "What does fire insurance do with the ashes it buys?" I can only reply, "Nothing." It neither exports nor utilizes them. It simply leaves them, with the confident assurance that the golden seed it has distributed will soon cause the ash heap to put forth a luxuriant crop of homes, factories, schools, churches, and emporiums of trade sheltering all the myriad fabrics which enter into human needs. In all this, however, no magic is performed. Fire insurance does not create something out of nothing; it does not cause a barren ash heap

to blossom forth in imposing facades and burnished domes. It does not even conserve or save, for its golden seed which sprout into the varied creations of human thought and toil must soon or late be garnered from the four quarters of the land. As the air is ceaselessly gathering up minute particles of water from the earth's surface, to hold in trust until condensation forces it to re-deliver its aqueous hoard, so fire insurance is ceaselessly gathering from city, village, hamlet, and farm its tribute, atom by atom, to hold in trust until conflagration shall compel it to refund its hoarded indemnity. There is this important difference, however, in the analogy: nature reinstates; fire insurance does not. Matter and energy are constant quantities. There is no loss in the transformation of water into cloud and cloud into water, but in fire insurance something disappears which can never be replaced. It is true that when a building or a city is destroyed, fire insurance makes it possible to create another building or city in its place; but the fact remains that something has disappeared, and the world is permanently impoverished by the event—as much impoverished as if fire insurance did not exist; but the loss escapes the attention of society at large because the material thing that has vanished in smoke and ashes is replaced by tribute gathered from the four corners of the land. The human effort that has been expended in transforming matter from its crude forms into things beautiful and useful is the immaterial thing that cannot be reinstated. The thing that has vanished forever is value. This insurance cannot replace. It simply gathers up comminuted values as the air absorbs

moisture, and releases its holdings where and when a value-vacuum has been caused by combustion. But again, unlike the rain which descends alike on the righteous and the unrighteous, fire insurance discriminates. It does not yield up its stored values except to him who has contributed for the service, and then only by an established ratio, which has to do with the relative liability of his property to fire, and the relative amount of value in this property for which he has purchased "a call" for a commensurate shower of indemnity. Unlike the atmosphere, which blindly desiccates one region to deluge another, fire insurance must exact value received and measure out its indemnity with the same scrupulous exactitude that the morning milkman exercises when he fills the quart cups for which he has sold milk tickets in advance.

From what has been said it will be seen that, strictly speaking, fire insurance belongs neither to the creative nor to the economic industries. It simply gathers dispersed values and transports them to the place where a vacuum has been created by fire, for the use of the person who has paid for this service, just as the railways, with which fire insurance has many problems in common, transport property from areas of low value to areas of high value for people who have paid the freight. Again, in gathering dispersed values from the many for a common purpose, it performs a function similar to that of the tax-gatherer. Indeed, in its ultimate analysis, the broadest definition of all kinds of insurance—life, fire, accident, marine, and what not (for it is possible in these days to buy insurance against the happening of almost any con-

ceivable event)—would be to call it a tax to make good the value-vacuums caused by some specific *change* from existing conditions in person or property. Along with this most general definition we find the collateral fact that contracts of insurance could not be entered into with safety by the obligor, were there not some reasonably well understood laws of change which establish what are known as averages; for it is upon the uniformity of these laws that the possibility of insurance of all kinds rests. If chance existed in sum-totals to the same extent that it exists in the individual instances which make up these sum-totals, the obligor, or insuring company, would occupy the same relation to chance as the obligee or insured person; but it does not so exist, and it is this fact which enables the insuring company (with comparative safety to itself) to assume the liability for disastrous change which constitutes pure chance with the obligee. In proportion as civilization has expanded its records over time and space, it has become more and more certain that the chance which is all in all in the individual instance fades out into averages as we approach the totality of things, until in a theoretical totality it becomes absolute certainty. The property owner over whom the catastrophe of individual instance impends buys exemption from a company, with which his chance is distributed over the number of similar individual instances which the company has assumed. It is true that no company, however large, has ever been able to distribute its chance among enough individual instances to reach the goal of absolute certainty found in the theoretical totality of

things, but every company that has gathered in enough individual instances or risks to constitute what is known as a distributed business has reduced its chance from the dangerous explosiveness of the individual instance into wave-like fluctuations which it can measure and change its rates to fit.

But this is an age of comity; the individual company is not limited to its own experience. Each year the statistical experience of all companies in the United States is published for the benefit of whom it may concern. The annual publication of these figures is looked forward to by underwriters with intense interest, as the nearest possible approximation to the certainty found in the sum-total of things. But still we do not find the invariable average of certainty in single years, for averages have to do with time as well as space, and the figures of all companies for ten-year periods afford a still closer approximation to the immutability of real averages—so close, indeed, that the underwriting income of all companies, when compared with their outgo for any ten-year period since combined records have been kept, exhibits a difference of perhaps not more than 1 or 2 per cent. in any one decade. These facts show that, whatsoever methods individual companies may adopt in the transaction of their business—and it must be confessed that some of them resort to methods largely speculative—the ideal conduct of the business, known in trade parlance as "sound underwriting," is the farthest possible remove from chance, and that whatever faults of omission and commission fire-insurance companies may be guilty of individually, fire insurance itself is

not a gambling business. On the contrary, its animus or intent is the very antithesis of gambling. In gambling we seek the danger and excitement of uncertainty; in insurance we seek the repose and safety of certainty. This ethical difference between insurance and gambling is today beginning to be pretty well understood by intelligent people, although it has not been many years since the pulpits thundered against insurance as an insidious form of immorality; and even now it is difficult to find a jury that does not look upon it as a gambling business in which the insuring company has all the advantages of a dealer in the game. On the other hand, it may be confessed that fire insurance had its birth in the spirit of gambling; else it would not have been born. All forms of activity which plunge into the unknown or untried are in one sense gambling, but we must admit that they constitute that beneficent form of gambling known as enterprise, which is the leaven of all human progress. Every new company, before it gets enough risks upon its books to establish at least an approximate average, must pass through a period of chance; it must take a gambler's risk; and this was more notable in the early days of insurance, when statistics were not, and the laws of average but dimly discerned. Insurance today perhaps more nearly than any form of modern activity fulfils in a strictly business way the divine injunction, "Bear ye one another's burdens;" but there is nothing to gain by denying that it owes its origin to motives far from divine, in that they were humanly selfish and to the last degree venturesome.

The earliest known form of insurance seems to

have been marine. We have no records of fire insurance until after the great London fire in 1666, and as a vague and ill-defined business—which, perhaps, partook more of the nature of gambling than of business (for the contracts of that day were not limited to simple indemnity and did not require an insurable interest in the property insured)—it languished until the age of steam. The invention of the steam engine brought about an early and enormous concentration of values in vast manufacturing and commercial establishments, with a corresponding growth of cities and expansion of transportation and banking facilities. Then, and not until then, did the full significance of fire insurance begin to make itself manifest. The triune world of manufactures, trade, and transportation was swathed in an atmosphere of credit. Manufacturers built their plants and bought their supplies on credit and sold their output to merchants "on time," who, in turn, sold to farmers, who were expected to pay when they sold their crops. Railways were financed and built upon a system of bonded indebtedness; banks loaned their depositors' money; thus completing a cycle of credit in which everybody was concerned. For the first time in history, commerce began to assume a resemblance to the human body, in which an injury to one member is an injury to all; but it was an unstable compound—nitrogenous and liable to explosive disintegration. The business world was confronted with the momentous fact that a fire, say, in a great mercantile establishment would cause the merchant to default to the manufacturer; the manufacturer to the bank; and the bank to its depositors, or,

at best, would compel it to throw its securities, composed of the obligations of others, on the market, and thus precipitate a general toppling of values, which might bring everything and everybody down in common ruin. If all this might happen from the burning of a single value-unit, the possibilities resulting from the burning of an entire city were too direful to contemplate. The mutual confidence and helpfulness which are the essentials of modern civilization could not exist in the face of impending disaster which might ingulf everybody. Common prudence began to suggest to the banker, the manufacturer, and the merchant to require, as a condition precedent to credit, that insurance be maintained; and then fire insurance began to assume its real function and to be recognized as an accredited member of the sisterhood of activities which constitute modern commerce—a member charged with the duty of changing the truculent chance of individual instance into the benign certainty of averages. Today the destruction by fire of a great manufacturing establishment or a mammoth entrepot of trade is a matter of daily occurrence, while every few months a goodly city is swept away by conflagration; but fire insurance promptly appears upon the scene and sows its golden seed over the ash heap, and in a few months a new city springs up to replace the old. Meanwhile the great world of human activities moves steadily on its course, unperturbed.

Fire insurance is the child of advanced civilization. When the chief avocation of man was found in furbishing his armor and practicing in the tilt-yard, it lay in the womb of the distant future. When men

stopped killing each other as the only honorable vocation and began to extend a friendly hand to each other in scaling the heights of material prosperity, fire insurance was born of the need of mutual helpfulness upon a strictly business basis. Today, in every nook and corner of the civilized world, the farmhouse, barn, granary, live stock, and crop, the mechanic's modest home, the massed values of our cities, the great industrial plants, the railway depots, shops, rolling-stock, and goods in transit, are one and all held in the hollow of the hand of fire insurance, and humanity goes tranquilly about its business with sleep and digestion undisturbed by the alarm of the fire bell, with serene faith in its pledge, "We hold thee safe." Surely this is an important and useful function, a function entitled to the respect and protection of the body politic.

At the present time thousands of corporations, big and little, are transacting the business of fire insurance in the United States, and annually several thousand million dollars of values come under their protection. The personnel of the industry aggregates perhaps a quarter of a million persons, at a moderate estimate.

It is proper to bear in mind that, so far as the buyer is concerned, all fire insurance is based upon credit. The policy holder pays his money for a contract that may or may not require a specific performance on the part of the company at an indefinite time —possibly several years—in the future. In the meantime he must confide in the honor and stability of the company. This would seem to make it to the interest of the purchaser of fire indemnity to look into the solvency and character of the institution he trusts with

the same care which he would exercise in confiding the same amount of value to the care of a bank, to remain on deposit an indefinite number of years, in which event common prudence would suggest that he satisfy himself, not only that the bank is solvent, but that it is likely to remain so. His only guarantee from the fire-insurance company is the hard cash which constitutes its assets, as revealed by its sworn financial statements and its known character for sound and safe dealing.

As the only function of capital in fire insurance is to stand sponser for the performance of a contract to be performed at some indefinite time in the future, it follows that the business may be transacted entirely without assets. This is shown by the existence of innumerable, and more or less ephemeral, "Mutuals" and "Lloyds." I will not attempt to describe these institutions, however, for they play a minor rôle in the business, and are not likely to play a more important rôle in the future. It needs no argument to show that the vast majority of the property values of the world are and must be protected by the contracts of corporations, with adequate cash capital, and a liberal surplus safely invested in standard securities that are instantly convertible into cash. These cash assets are as necessary to the safe conduct of the business as a central reservoir is to the control and equitable distribution of a municipal gas supply.

It would be difficult to find any class of corporations in the world whose assets are more carefully invested or more readily convertible into cash than those of the standard companies on whose shoulders

rests the responsibility of making good the value-vacuums caused by fire.

The general agency business of the country is transacted by about one hundred and seventy-five companies, native and foreign, with individual assets ranging from a few hundred thousand to twenty million dollars each. These companies all conform to the insurance laws of the several states in which they transact business, and the laws of each state vary from those of every other state. Each company must make a deposit with the state, if so required by law, and make annual reports of its aggregate business as well as of the business done in the state, accompanied by a statement of assets and liabilities, and when required submit to an examination by the state authorities. It must pay for a certificate of authority for itself and for each of its agents, and in addition pay a tax on the amount of its business in the state, the entire taxes of the companies in all states averaging about 3 per cent. of the premiums received, which is considerably more than the net underwriting profits of the industry itself.

Having complied with the numerous and onerous exactions of the states, and appointed an agent in the towns where it transacts business, the company must equip each agent with an outfit of supplies, consisting of stationery, blank printed forms, policies, a register, in which to keep a record of all policies issued, a map showing every building in the town, including its structure, exposure, and occupancies, and a printed tariff giving the rate of each building and contents. The company must also purchase a copy of the map

and tariff for use in its own office. These maps and tariffs must be frequently corrected to keep up with the constant changes that occur in structure, occupancy, and exposure, in order that they may furnish reliable information as to the present circumstances of each risk. Without this correction they would soon become obsolete and misleading. The extent of the labor of constructing these maps and tariffs may be surmised from the fact that the map of this city alone, consisting of sixteen large volumes, costs about fifteen hundred dollars to each company. The Chicago tariff alone, which is constructed by the so-called card system, fills a cabinet about the size of an ordinary bureau, and to keep this corrected up to date costs each company about one thousand dollars per annum. As the making and correcting of maps and tariffs require a separate examination from cellar to garret of each building, it will readily be seen that no single company could afford the expense. The work of rating and mapping is necessarily co-operative—the expense must in one way or another be shared by all companies.

When a company has complied with all these preliminaries and is equipped with an agency plant, each agent is expected to go out and solicit business, and, when secured, to issue policies and from time to time make such indorsements as may be necessary, keeping a copy of the written portion of each policy and indorsement in his register, and forwarding another copy on blanks, known as "daily reports" and "indorsement reports," to the company. For this work agents are paid by a commission on the premiums they collect.

The income and outgo of every stock company naturally divide themselves under the following heads:

1. Income: (*a*) earnings of assets; (*b*) fire premiums.

2. Outgo: (*a*) fire losses; (*b*) expenses.

The first item of income, *i. e.*, "earnings of assets," is to be considered as a thing entirely separate and apart from the transaction of fire insurance.

Each stock company is required by law to make good any impairment in its capital without delay, hence it is an advantage to have a liberal margin of surplus over its capital and all outstanding liabilities. This margin (known as net surplus), with most of the leading companies, is as large as the capital, and with many companies three or four times as large. In addition to capital and surplus, each company collects its premiums upon the issuance of policies, and as it does not have to pay losses until they occur, it holds an additional fund in trust known as "unearned premiums," amounting to an average of, say, 60 per cent. of its annual premiums. The company has the usufruct of this fund as well as of its capital and surplus, and as its assets are kept, as closely as possible, invested in interest-bearing securities, its income from the earnings of its assets is, as a rule, much greater and more certain than its net underwriting income, though this is of course dependent upon the relation of its net surplus and annual premiums to its capital. As an illustration let us take the figures of a prominent American company:

Capital	$1,000,000
Net surplus	4,500,000
Unearned premiums	2,000,000
Total	$7,500,000

The interest on the total at, say, 4 per cent. is $300,000, which would pay an annual dividend of 30 per cent. on the capital of $1,000,000, even if it had not made a penny in its underwriting.

When the total assets of a company are large compared with its capital stock, a moderate change in the stock market makes a large difference in its assets when this difference is compared with its capital stock. In the instance just cited, a change of 10 per cent. would make a difference almost equal to the entire capital stock of the company. These facts demonstrate that the financial income and the underwriting income of a company are entirely independent of each other. A company's annual statement may show a handsome gain when it has lost heavily on underwriting, or it may show a large depreciation of assets when it has actually made money on its underwriting. If the stockholders should sell their stock and individually invest the proceeds elsewhere, the results would be precisely the same, if invested with the same judgment. It is important to bear this fact in mind, because the companies are often blamed for charging exorbitant rates, while making inordinate profits; when if their statements were analyzed, these profits would be found to be derived entirely from a sharp advance in market values, added to the earning capacity of their own assets.

Every piece of insurable property liable to be destroyed by one fire, as, say, a building and contents, is known as a "risk." It is possible for a company to cover a number of risks under one policy, as is often done. The amount a company is willing to insure on

a given risk is known as its "line." A given risk may embody value to the extent of many hundred thousand dollars on which no conservative company would assume a line of over $5,000. This makes it necessary for agents who control such risks to represent a number of companies in order to accommodate their patrons, and it is not uncommon for an agent to represent as many as twenty companies.

Every well-managed company furnishes its agents with a list of the classes of property it does not insure, which is known as its "prohibited list." It also furnishes them with a list of the lines it will carry on the business it writes, which is known as its "list of maxima lines." As it is a vital necessity for each company to have its liabilities distributed, it is usual for companies in addition to their line list to instruct their agents as to the total amount they will carry in any one block, this amount being known as their block limit.

As the necessities of agents often compel them to represent many companies, and as their compensation consists of commissions, it follows that the company paying the largest commission is likely to receive the best treatment from agents. Efforts in the past to induce all companies to agree upon some maximum compensation to agents have invariably failed. About 40 per cent. of the companies transacting a general agency business are a law unto themselves as to rates and commissions.

I do not propose to weary you with a prolonged description of the *modus operandi* of fire insurance, because, perhaps, no two companies have the same *modus,* and a comparison of their individual methods

would be as tedious and unprofitable as a comparison of the relative merits of the same number of housekeepers. Every successful company has its special, often indefinable, trade secrets, which enable it to handle certain classes and circumstances more skilfully than many of its competitors, and thus year after year to gather figs where others gather thistles.

When an agent secures a risk and has determined which of his companies he will place it with, he writes out a policy, and makes two copies of the written part of this policy, one in his register and one on a blank daily report. The latter he mails to the company, and its contents constitute the immediate information on which the company determines the acceptability of the risk. In addition to a copy of the written portion of the policy, this daily report contains certain queries which are expected to be answered by the agent—queries as to the amount of total insurance, value of the property, title, incumbrances, etc., including location of risk in map, and amount of other insurance carried by the company in the same block. On receipt of this report it is entered in the company's register, mapped, compared with commercial and fire records and tariff, and passed to an examiner, who carefully looks into all the circumstances of the risk, as shown by the daily report and other data. If the examination is satisfactory, the document is marked approved and passed to the files. If the information reveals unsatisfactory conditions, the risk is declined, or further information is elicited by correspondence, and in some cases the matter is referred to a special agent for personal investigation. When a daily report has been finally

approved and filed away, it is not again heard from during the life of the policy, unless there is some change in the ownership or circumstances, which requires an indorsement or investigation, or unless the property is damaged or destroyed by fire. When a change occurs, the agent is expected to indorse the policy, collect premiums for any increase, or refund premiums for any decrease in hazard, and report the facts on a blank indorsement report. Changes are constantly occurring which necessitate indorsements, and an indorsement frequently entails more labor for agent and company than the issue of the original policy.

While every company employs traveling representatives to look after changes of agency, collection of balances, adjustment of losses, inspection of risks, etc., the numerous duties and interruptions of these employees make it impossible for them to inspect personally all risks, and with the few companies which employ a force large enough to attempt this an inspection may be so delayed as to be of no value in the acceptance of business. Hence, in the nature of things, the information upon which the great part of the business of the country is written is furnished by agents and policy holders.

Taking it all in all, the care exercised by any well-managed company in approving a risk is as great as that taken by a bank in passing on a loan, though the amount of detail in preliminary investigation is vastly greater with the risk than with the loan. The necessity for this care is even more urgent with the risk than with the loan, for the facts are more numerous, obscure, and inaccessible, and the liability to loss

through oversight, carelessness, or error of judgment just as great.

When a loss occurs under a company's policy, it becomes its duty to send a representative to adjust the loss with the assured under the terms of the contract. Then, as a rule, the assured reads for the first time the contract which he has been depending upon as his bulwark against disaster. Before a man enters into any other contract of equal importance, he is apt to read it over carefully several times; to criticise the exact shade of meaning of every phrase, word, and punctuation point; and not infrequently he employs the best legal talent to see that the contract protects his interests at every point. For some inscrutable reason people look differently upon an insurance policy, as they habitually chuck it into a pigeon hole, unread, pending a fire. When a loss occurs the policy holder as a rule begins for the first time to read his policy and file his objections. In fine, most people insist upon making their fire-insurance contracts after the event instead of before, as they make other contracts.

The insurance policy has long been subjected to unfriendly criticism from courts, legislatures, newspapers, and the people, as an *ex parte* contract formulated by the companies—a contract whose real meaning is, with intent, buried under a mass of confusing verbiage. The facts are that the fire-insurance policy, when not formulated by the states themselves, is a growth rather than a creation of any one man or set of men. It has been more carefully considered from all sides and in every detail, perhaps, than any document yet formulated by man, and probably there is no document in which as wide a scope of definite and

clearly expressed meaning has been compacted into as few words. The printed portion of a fire policy, which contains practically all the conditions of the contract under which in their myriad forms, conditions and circumstances, all the values of the world, destructible by fire, are insured, embraces about one thousand words, which is about half as many as are found in an ordinary trust deed. A careful reading of a fire policy will constrain any fair-minded man to admit that more could not be said in fewer words or clearer language, except perhaps where the language has been imposed upon the companies by statutory enactment.

In the early days of the industry each company used its own form of policy, and much confusion resulted from conflicting conditions, especially when several companies were concerned in the same loss. An insurable interest was not required. The idea that the contract was one of indemnity was not embodied, and the absence of these features made it in effect a gambling contract. Gradually the structure and intent of these policies began to crystallize into something like uniformity, though no attempt seems to have been made to make the language of all printed policies the same until after the Boston fire of 1873, when the Massachusetts legislature formulated a standard policy which all companies transacting business in that state were required to use. This form was substantially adopted by most companies for use in other states. Later the state of New York appointed a joint committee, composed of legislators, attorneys, and practical underwriters, to construct a policy, and the result of their labors, known as the "New York Standard Policy," has since been made obligatory, with slight

modifications, in most of the states, and even where not obligatory has been generally adopted by the companies.

Briefly described, the completed fire policy in current use states the consideration, amount insured, and time limit, and identifies the property by a written or printed description.

If it is necessary to make the terms of the contract more liberal than its printed conditions, the point is covered by a written permit; or, on the other hand, if it is necessary to impose conditions not mentioned in the printed part of the policy, these conditions are set forth as warranties on the part of the assured. The printed part of the policy states that the company shall not be liable beyond the actual cash value of the property at the time of fire, after proper deduction has been made for depreciation; that the loss shall, in no case, exceed what it would cost to repair or replace the property insured; and that, in case the parties cannot agree upon the amount of loss, the company and assured shall each select an appraiser, the two so selected to choose a third, and that the award of these appraisers as to the amount of loss shall be decisive, it being optional with the company to repair, replace, or rebuild the property with other of like kind and quality. The policy then goes on to state in detail what will render it void, what it does not cover, how it may be terminated by either party, and what is necessary for the assured to do after a fire. Stated in a nutshell, this is the substance of the fire policy. That it cannot be materially improved is shown by the facts that it has stood the fire of criticism for many years, that legisla-

tive bodies have not been able to add to or subtract from its conditions to any material extent, and that for more than a generation capital has not been tempted to hazard itself under the terms of a contract more liberal to the assured.

It will be noted that the basic idea of this contract is that the assured shall not make money by his fire—shall not be able to turn his misfortune into a speculation; and all experience shows that this is a necessary safeguard to public interests.

When a company receives notice of a loss, it becomes its duty to fulfil its obligations. A representative must be promptly dispatched to the scene of the fire to adjust the loss and pay the insured the indemnity he has bargained for. The adjustment of a loss is often a transaction in high diplomacy. The amount involved may range from a few dollars to a million dollars or more. In many respects an adjustment resembles an ordinary transaction in barter, with the important difference that in ordinary barter the buyer has an opportunty to examine the object he buys. The adjuster, as a rule, does not. In ordinary barter the purchaser pays for something that *is;* in fire losses the adjuster pays for something that *was.* He is called upon to purchase something analagous to a pig in a poke, or, more properly, a pig that was in a poke.

The merchant who offers his goods on a profit of 1 or 2 per cent. does not have much margin for "inducements" to buyers. The aggregate profits of fire underwriting are not at most over 1 or 2 per cent. Even if the company he serves has been exceptionally successful, its underwriting profits for long periods

seldom, or never, exceed 5 per cent., which is equivalent to an average of not more than fifty cents for each thousand dollars at risk. With this slender margin of profit the adjuster knows that if he allows his sympathies to tempt him into habitually paying the assured the smallest percentage in excess of actual value, he will change his company from a money-making into a money-losing institution. He knows further that any undue liberality on his part will slowly but surely create a moral hazard which will reveal itself in an increased loss ratio. He knows that if he leaves behind him a man overpaid, there is a strong probability that some of his observant neighbors of easy virtue will soon be over-insured. On the other hand, he knows that if he does not leave the assured with a conviction that full justice has been done, he will be sure to tell his grievance and create a prejudice against the company which will ruin its business in the town. Between these contending influences there is only one plain course, and that is to be strictly judicial; for there is no transaction in the realm of trade in which there is less room for advertising "inducements" or lordly liberality than in the adjustment of fire losses. On the other hand, perhaps no other negotiations in the world of trade, volume for volume, are brought to a conclusion with more tactfulness, wiser liberality, or less friction. This is proven by the fact that the amount of losses in litigation, as shown by published statements of the companies, is so small that it hardly constitutes a percentage of their annual premium receipts. If any evil exists in the adjustment of fire losses, it

undoubtedly leans toward sympathetic and systematic liberality in the settlement of honest losses, and a failure thoroughly to ventilate those that bear the earmarks of fraud. It would be idle to claim that mistakes never occur or that injustice is never done to honest claimants, but these mistakes, as a rule, are the result of a scarcity of the peculiar talent necessary in the difficult work of adjusting.

An ideal adjuster is partly born and partly made by experience, but no experience can make a successful adjuster unless birth has done its part. The ideal adjuster needs not only to be honest, but to look honest. He should inspire confidence by his tact, address, and personal magnetism. He ought to be familiar with insurance law, commercial usage, and human nature. He needs a Sherlock Holmes nose for detecting and tracking fraud to its lair, and, at the same time, a nose equally sensitive to the aroma of honesty—a nose that will lead him unerringly along the path that lies between the boundaries of optimism and pessimism. He must know much of the nature and values of all classes of property. He ought to be a skilful accountant, and enough of a builder to make a detailed estimate of the cost of replacing a vanished building. He ought to have a fair knowledge of literature and art, know books, pictures, music, and musical instruments. He ought to be a family man and a ladies' man, in the best sense of the term. He ought to be a connoisseur in pots, kettles, and dish-pans, cook stoves, pianos, photograph albums, Little Liver Pills, Radway's Ready Relief, and all the long category of alliterative cure-alls, sewing machines, silverware, bedding,

books, bicycles, bonnets, and wearing apparel, without regard to age, sex, or condition, from baby-linen and ladies' *lingerie* to hob-nailed shoes, golfing suits, St. Patrick's Day regalia, and liver pads. He ought to be able to recognize at their true value pictures of every school, including the boarding school. He ought to be an expert in all "objects of bigotry and virtue," with their endless variety and range in value, from the plaster casts and chromos in the humble home of the farmer or mechanic to the priceless art treasures in the palace of the plutocrat. He ought to be prepared to deal with all these things, hallowed by prejudice or associations, bruised, battered, torn, water-soaked, smoked or reduced to an ash heap, knowingly, sympathetically, reverently, and unflinchingly. The annals of statecraft furnish no more shining examples of diplomacy than could be told of the everyday experience of the fire adjuster.

If friction in the adjustment of fire losses exists, it is because the man who can be and do these things—the ideal adjuster—does not grow on every bush.

Every prominent company employs its own adjuster to attend to its miscellaneous losses, but it is a matter of frequent occurrence for a fire to destroy a large risk in which scores of companies are interested. In such cases it is usual for the companies to select a small committee of adjusters to settle the loss. The difficulty of reaching all losses promptly and of securing competent adjusters has built up a class of independent adjusters who are located in large cities. These men are not on the salaried list of any company, but charge for their services on each loss, and where

they serve more than one company the expense is distributed among them pro rata. In a few of the larger cities adjusting associations have come into existence, and in time the economics of the business will compel the adjustment of all large losses through these associations, as they simply embody the specialization now found in every branch of modern industry.

While a considerable part of the small-value risks written by companies must be accepted or rejected through correspondence, upon the inspection and reports of local agents, the selection of their business depends largely upon the personal inspections of salaried employees, and the success of every company to a large degree depends upon the judgment of these "field-men" in weeding out untrustworthy agents and objectionable risks, and effecting reforms in physical hazard. A conscientious and capable inspector may save his company thousands of dollars by a single cancellation or by effecting reforms in the physical hazard of risks in which his own and perhaps many other companies are interested. A judicious suggestion to the owner concerning some dangerous feature of his property, of which he, perhaps, is ignorant, may, and often does, save a loss amounting to several hundred thousand dollars, and, counting exposed property, even millions of dollars. Hence it will be seen that the work of the inspector benefits not only all insurance companies, but every property holder. A good inspector is a reformer in the morals of property, and indirectly in the ethics of its owners. It is his duty to study property of all kinds in its relations to the hazard of fire. He should have a pretty fair working knowledge of mechanics, physics, chemistry, and electricity, and of the laws of supply and demand in all the leading branches of trade and manufacture. He should be a good judge of values, of men, of municipal affairs and their prospects, of building construction, of the safety of heating, lighting, electrical and fire-extinguishing devices, public and private, as well as of machinery, friction, dangerous chemical combinations, of the explosive and combustible properties of matter in its combined or comminuted forms, and heaven knows how many other things.

The universal trend of the business toward economic co-operation is shown by the recent evolution of inspection associations. An inspection bureau exists in this city to which about forty companies belong. This bureau employs only graduates of technical schools who are trained for their specialty and employed in examining the great mercantile and manufacturing establishments of the country. This plan has been found to secure a higher grade of inspection at less expense, and saves the owners from the annoyance of frequent inspections on the part of the employees of the several companies. The work of inspections is a heavy item in the expense account of fire insurance, but it is fruitful in saving to the companies and the public, and the tendency is to increase this expense as an investment equally profitable to the business and the community.

I stated at the outset that, strictly speaking, fire insurance belonged neither to the creative nor economic industries, but it is necessary to modify this statement, for through its inspections alone fire

insurance saves enough fire waste annually to entitle it to rank as a world-leader in practical economics. Inspections are but one phase of its economic functions.

Fire departments were originally owned by the fire-insurance companies, and maintained by them, until it became evident that they were an economic necessity to the entire public, when they were transferred to municipal control. Under the tariff system a credit is allowed for fire departments according to grade, and every policy holder is allowed a reduction in his rate commensurate with the degree of protection. Not only the existence, but the efficiency, of fire departments is due to fire underwriters, for they are the only people whose experience makes them competent to advise, and the only people directly interested in securing an efficiency commensurate with the rate reductions they allow for these departments.

You will find scattered about this and every other large city numerous fire-patrol stations with teams, fire extinguishers, tarpaulins, and from six to twenty men at each station. These patrols are maintained at the expense of the companies. They have every known device to enable them to receive the earliest news of a fire and to reach it promptly. Their duty is to extinguish a fire, if possible, in its incipiency, in order to stop the damage that always results when the engines of the regular fire department once turn on their hose. If the fire cannot be extinguished by the patrol, it is its duty to cover the merchandise in the burning building, or buildings exposed by it, with tarpaulins, in order to minimize the damage from water and smoke. These patrols also publish detailed

accounts of every fire, giving an estimate of the damage and stating the cause of the fire. This information is invaluable in an educational way, and the direct saving effected by patrols is incalculable.

If you will visit the Western Salvage Wrecking Co., corner of Madison and Franklin streets, you will find an immense establishment devoted to the care of merchandise that has passed through a fire. Damaged merchandise is brought here from all over the West, and every dollar saved by the scientific treatment of and restoration of values in this merchandise helps to reduce the average loss ratio and everage rate of the country.

At No. 67 East Twenty-first street of this city you will find an extensive laboratory devoted to the scientific investigation of physical hazard. Numerous experts are constantly engaged in studying the new chemical combinations of commerce; every new device for utilizing inflammable oils and acetylene gas for motive, heating, or lighting purposes is here carefully investigated, as well as all automatic devices for extinguishing or giving notice of fires. Electricity and every form of electrical installation are under constant and careful study. All these things are permitted by the companies only under careful regulations predicated upon the information gathered through this and other instrumentalities maintained by the companies.

I might go on and describe other things of a similar nature, but these will suffice to show that, while the organic function of fire insurance is simply to measure and distribute fire hazard, in the perform-

ance of this function it is forced to act as a conservator of property values, and thus becomes one of the most important economic forces of modern civilization.

This fact is so little understood by the public and press of the country that it is refreshing to find a frank acknowledgment of it in a recent issue of the Houston *Press,* of Texas—a state where seemingly no expedient has been left untried which promised to crush out all possibility of co-operation among fire underwriters:

> It is a mistake to believe that the only return the premium payer gets is when he collects his insurance money after a loss; that it is necessary to burn out to win in fire insurance. An honest insurer, if burned out, always loses in inconvenience, anticipated profits, and disruption of business. The insurance policy only protects him from financial loss to the extent of the property actually burned or damaged. Where the insurer profits by fire insurance is in the fire-prevention work of the insurance companies. The whole community also profits by this and is the debtor of the insurance companies and the people who pay the premiums and make such work possible.

While every fire company, like every individual, is a selfish entity, all companies are united by inseparable interests into a whole, consisting of "many in one," just as the several states constitute a union. In this *e-pluribus-unum* nature of the industry is found the inexorable necessity for co-operation in establishing common knowledge, common usages, and a common measurement of the fire hazard, for these are necessary to establish the common averages which enable fire insurance to exist. It is important to bear these facts in mind, because they tend to explain a fruitful source of misunderstanding between the public and the fire-

insurance community. The necessities of their business are such that fire underwriters are always conferring together over the innumerable questions which their individual experience does not enable them to solve. Like birds of a feather, they flock together, not because they love each other, but because they are indispensable to each other. Hence we find fire-underwriting associations at every turn—local, state, sectional, and national; associations of agents, of field men, of managers, and of presidents; associations of adjusters, inspectors, raters, statisticians, experts in electricity, chemistry, mechanics, physics, and what not. But, aside from these permanent associations, there is a never-ending necessity for special conference on important questions of temporary interest. Meetings of this kind, sometimes many of them, are made necessary by every considerable conflagration, and by nearly every important conflict of opinion. In the vast majority of these conferences the establishment of a harmonious and definite purpose is as necessary to the common weal as to the weal of fire insurance, but these constant conferences tend to create an impression in the public mind that fire underwriters are a set of arch conspirators, and the laws of many states have been framed with the special purpose of shutting off all possibility of united action in the business.

It may be asked why the necessity for this constant exchange of views exists in fire insurance to a greater extent than in other kinds of insurance; for they all deal in averages. The answer to this is plain. Other kinds of insurance deal in averages, but they deal in the averages of identity alone, while fire insurance is

concerned, not only in the averages of identity, but with the relations of every individual instance to these averages. Other branches of insurance deal with classes composed of individual instances, each of which is required to conform to a standard, and then treated as identical with all others. Fire insurance, too, deals with classes, but the individual instance in perhaps ninety-nine cases out of a hundred does not conform to any standard, and cannot be treated as an identity. Its relation in hazard to numerous standards must be measured and specifically established and stated as its rate, and from every standpoint it is necessary to deal with each risk as a separate entity instead of as an identity with all other risks belonging to its class. This individual treatment which is unavoidable in fire insurance sets it apart from all other branches of insurance. Fire insurance is not a jobber in averages, but a retailer, and this not only makes it a business of infinite detail, which is the concern of all, but keeps it in constant and unpleasant evidence before the public, which cannot understand the reason for its never-ending pourparlers, caucuses, confabulations, and inter-meddling with their property.

If the life companies, instead of dealing with the identities known as standard lives, were compelled to establish their rates by analyzing the human body into a standard heart, stomach, liver, etc., and were thus forced to keep these and other vital organs up to their several standards, it would become necessary for them to establish innumerable expert committees on diagnostics, prognostics, therapeutics, dietetics, etc., and send around inspectors to sound, thump, prod,

probe, and otherwise inspect each of their risks from cellar to cockloft, and ask embarrassing questions about their personal condition and habits. It is easy to see that with all this thumping and pumping the lot of the merchant prince with several hundred thousand dollars of life insurance, like that of the policeman in the *Mikado,* would, all in all, not be a happy one. Life insurance escapes these things because it does not concern itself with specific instances. Fire insurance is foredoomed to eternal servitude to the individual instance; *hinc illae lacrimae.*

The difficulty of measuring the relative hazard of each risk is augmented at the outset by the important fact that this relative hazard is largely determined by the form of the contract. In life, and other forms of insurance dealing with simple averages, every risk-unit, being a simple identity, is protected by identical contracts. The same policy blank may be made to serve for any risk-unit by simply inserting the name, date, amount, and consideration; but in fire insurance diversity of contracts is commensurate with the diversity in risks.

It is possible through the wording of a policy to cover property that is widely scattered, and not all subject to destruction by one fire. To illustrate: Let us suppose that a manufacturer starts in a small way with a single, open building, which, with its contents, is liable to destruction by a single fire. He insures this property for, say, 80 per cent. of its value. The growth of his business soon compels him to erect another building separated by a fire-proof wall, or perhaps by space so great that there is little or no

danger of both buildings being destroyed by the same fire. He asks the insurance companies to spread his policies to cover the new building as well as the old, so that in the event of a fire in either building he will be able to collect his loss. It is evident that by thus spreading—or, as it is called, "blanketing"—his insurance he secures twice as much indemnity as he paid for and thus reduces his rate one-half. As his business expands he may erect other buildings which constitute separate risks, and if he could keep on blanketing his policies, he would finally be able to reduce his rate and secure indemnity covering ten times as much property as he has paid for. This is a *reductio ad absurdum* perhaps, but the fact remains that there is a constant pressure from the owners of similar property to have their policies so worded as to cover the largest possible value for the smallest possible consideration; in other words, to dodge as large a share of their fire tax as possible. It is fair to add, however, that there is in many instances an imperative necessity for what is known as "blanket insurance." It is possible, say, for a manufacturer to estimate the value of each building and its machinery, but his materials, "raw, wrought, and in process," are constantly floating around in different buildings, and it is impossible for him to tell how much value will be in any one building at the time of fire, or how much insurance he will need. This difficulty is met by writing a blanket policy covering all his buildings with either a distribution or co-insurance clause. The former provides that the policy shall attach in each building or division in such proportion as the value

therein shall bear to the entire value of the property insured. The latter provides that the assured shall maintain insurance on the property to a certain proportion of its value (generally 80 per cent.), and that, failing to do this, he becomes a co-insurer to the extent of the deficit, and to that extent shall bear his proportion of the loss. These clauses simply compel the assured to keep his property insured for an adequate part of its value, and if he does this, the clauses have no effect in the settlement of his loss. Strange as it may seem, the companies are forbidden by law in many states to use either clause.

The pressure for blanket insurance emanates almost exclusively from the ownership of large and scattered values. It is most prevalent among large mercantile and industrial establishments, warehouses, railway, and other property belonging to corporations and trusts; and in forbidding the only policy condition that will prevent these concerns from loading a large share of their fire tax upon small property owners, the politicians have, unconsciously perhaps, joined in a "hold-up" of the community for the benefit of those whom they are accustomed in their stump speeches to refer to as robber barons.

But the relation of insurance to value, like all dilemmas, has two horns. Property such as I have described is free from what is known as moral hazard. In no event could it be totally destroyed. In no probable case could the assured sell out "lock, stock, and barrel" to the insurance companies. In such risks a fire, in ninety-nine cases out of a hundred, simply causes a temporary suspension of a profitable business,

with inconvenience and loss of prospective profits to the owners. Experience has shown that there is comparatively no danger resulting from the moral hazard of over-insurance with property of this kind.

On the other hand, over-insurance *is* a constant menace, not only to the companies, but to the community. When an owner has a motive for being careless or applying the torch to his property, no rate offers any temptation, for the law of averages is set at naught. This danger might be said to infect risks liable to total destruction by a single fire, and supposably exists in all cases where such property is insured for all, or more than, its value. With all the care that can be exercised in scrutinizing the relations between insurance and value, it is an undisputed fact that there is a constant process of selling property to the fire companies. Every company is dependent for such information as it can get regarding value upon either the assured himself or its local agent, and the danger of over-insurance is largely unavoidable. The only safeguard against this danger is found in what is known as the "Three-fourths Value Clause," which provides that in the event of loss the insurance shall not be liable for an amount greater than three-fourths of the actual cash value of the property at the time of the fire. As an incendiary fire may not only destroy the building insured, but many buildings, and occasionally an entire town or city, it will be seen that this clause constitutes an equitable safeguard against the dangers of incendiarism; notwithstanding this fact many states forbid the use of this clause and compel an insurance company in the event of the destruction

of a building to pay the amount named as the limit of liability in its policy, regardless of the actual value of the property destroyed.

I have endeavored to explain to you how, at the very outset, fire insurance is confronted with the problem of establishing uniform relations between value and insurance as a condition precedent to any attempt to establish equitable relations in the measurement of the hazard found in each risk; in other words, in the attempt to rate it truly. I have pointed out to you the simple and just means of accomplishing this through policy conditions which are interdicted by the laws of many states. You will readily infer from what has been said that the correct ascertainment of value is a condition precedent to the equitable treatment of the public, because every deviation from uniformity in the relation of insurance to value must cause one of two things—either an increase of loss through incendiarism, or an unjust distribution of the tax to which all policy holders must contribute.

If we turn our attention for a moment to state and municipal taxes, we shall find that the ascertainment of property values is the beginning and end of the work of assessors, boards of equalization, and boards of review. How well these officials succeed in their comparatively simple task we may learn from the constant criticism of their work in our daily press. Fire insurance, too, must ascertain values before it can intelligently rate or insure a risk, and if its methods are not faultless it can at least plead the example set through its officials by the state itself. But this ascertainment of values is simply the beginning of the work

of rating itself, which constitutes a problem as difficult and complex as may be found in any of the modern sciences—even more difficult, perhaps, for the scientist deals with truthful matter, while fire-rating is perturbed from within and without by the prejudices and passions of men.

Fire insurance possesses no secret which enables it to thrive upon the sale of its indemnity at less than cost. Its profit margin cannot be measured by single years, for it is established by periods of years, and for any ten-year period we may select, since its combined statistics have been kept, we shall find that its outlay for losses and expenses has almost exactly equaled its premium receipts—in other words, that its indemnity has been sold at cost. With this equipoise produced by obscure laws of causation, found perhaps in every form of intense competition, it is self-evident that it cannot grant competitive rates to a single state, property class, or policy holder without adding to the rates of some other state, property class, or policy holder. As with all other forms of taxation, a concession to Peter is a robbery of Paul.

The subject of fire-rating bristles with so many complications that any attempt to explain it in detail in the short time at my disposal will, I fear, lead you into a quagmire of confusion. Mathematicians have figured out that under the law of permutation the twenty-six letters of the alphabet may be combined into trillions of pronounceable combinations, and that the fifty-two cards in a deck are susceptible of so many combinations that if the entire population of the world were to deal cards day and night for a hundred million

years, they would not exhaust one hundred-thousandth part of the possible deals. The causes of fire are countless; if we limit these causes to, say, one thousand, the possible combinations of causes of fire found in destructible property would make a row of figures that would girdle the world. You will readily see that to estimate the relative effect of each of these causes would be as vain as an attempt to count the sands of the seashore. But these causes, as numerous as they are, are multiplied by the causes found in other property exposing the risk. We have thus a numerical series of combinations approximating infinity, but this does not end it, for in addition to these active causes of fire there is another long series of conditions which simply exercise an influence in determining the extent of each fire, some accelerating and some retarding it. All these, however, are not incident to every risk. A certain limited number cluster about each property class, and it is the business of fire insurance to study and familiarize itself with the principal causes and influences incident to each class.

All these things are plainly classifiable under two heads, physical and psychological. Physical causes are inherent in property itself, and are designated by the name "physical hazard." Psychological causes are found in human nature, and constitute what is known as "moral hazard." Moral hazard is obscure, far-reaching, and not measurable. All who pay the insurance tax must help to pay for moral hazard. It is found in the owner of property in a degree that corresponds with the proportion of insurance to value. It is found among his enemies in proportion to the

dynamics of their enmity, modified by moral training and environment. It may come from carelessness on the part of owners, employees, or customers. It may emanate from a tramp, or a person suffering from the form of insanity known as pyromania; or it may start from a mere child through carelessness or malice. Recently a ten-year-old Chicago boy confessed to having started four fires because he wanted to see the engines play. More recently an incendiary was convicted by the courts in this city who, with good reason, is supposed to have destroyed property exceeding one million dollars in value.

In physical hazard we find incendiaries in the most insignificant and unsuspected things. An air-bubble in a window glass, a lens, or a decanter may focus the sun's rays and start a fire. A greasy rag thrown into a closet or corner and forgotten may break out into flames at any time. Again, things in themselves innocuous become dangerous in combination or in mere juxtaposition. A cow and a coal-oil lamp between them started a historical conflagration. A child and a match, or a mouse and a match, constitute a combustible juxtaposition. A woman, a candle, and an imaginary man under the bed constitute a cubed juxtaposition as it were. Gasoline stoves are justly considered one of the most prolific sources of fires, yet a recently published list stating the origin of fires in St.Louis for 1901 shows that one-half as many fires were started by balloons falling on roofs, and one-fourth as many by Christmas trees, as by blazing gasoline stoves; which facts go to prove that a due regard for economics should prompt our lawmakers to change

Christmas and the Fourth of July to the Twenty-ninth of February. Hot ashes are looked upon by underwriters as one of the most prolific sources of fire, but I find from a similar report of this city for 1901 that sixty-one fires originated from hot ashes, while two hundred and ninety-eight originated from prairie fires —a ratio of five to one. The two lists enumerate over twenty-three hundred fires from unknown causes; and in this connection it is proper to add that another baffling difficulty in the measurement of hazard is met, for the origin of fires in the great majority of instances is not ascertainable, and hence not estimable as a factor of causation.

Every modern building has evolved a nervous system of its own, consisting of innumerable electric wires which thread its innermost recesses, cluster like cobwebs about its inner and outer surfaces, and roam off at will through crowded alley-ways and dark conduits to consort together and lap up skim-milk-colored lightning in some den of purring dynamos with glittering teeth and death in their eyes. A dusty electric wire is one of the limpest and most harmless looking things imaginable, but it belies its looks. Aside from its cat-like fondness for disreputable localities, it exhibits other feline traits—it exhibits a more than cat-like suddenness. Stroke its back, or even touch it, and the life- and property-destroying sparks will fly. It has a cat's aversion to water—a mere drop, even a little moisture, is liable to throw it into a conniption fit known as a short circuit, and cause it to spit liquid fire from Dan even unto Beersheba. A chance meeting between a mild-mannered tabby of the telephone vari-

ety, hailing from an eminently respectable residence quarter, and a slouching Thomas cat of the arc-light breed from the Stock Yards, is apt to raise a disturbance that can be suppressed only by calling out the fire department. Tread on the tail of one of these grimalkins of any breed almost anywhere, and it is liable to arch its back and expectorate blue ruin almost any elsewhere, possibly several elsewheres; for as many as seven simultaneous fires have been known to be started by a single electric wire.

The futility of any attempt to analyze and measure the relative hazard of the innumerable, and in most cases unknown, causes of fires, is self-evident. Fire-rating is not done in this way. Whether we consider it a science or an art—one, both, or neither—it deals in broad effects—somewhat like the scene painter as compared with the miniature painter. Fire-rating accomplishes the task of fixing its selling prices or rates by what is known as the "schedule system," which, at the outset, may be described as an equitable system; for the fire-insurance schedule does not recognize individuals, dealing only with physical hazards. This system consists of what is known as a "basis schedule" of each important property class. These schedules are applied to specific risks, and the established rates of each town are grouped and arranged by blocks and street numbers, and published under the name of a "local tariff," so that it is only necessary to refer to the proper tariff to find the rate of any scheduled risk in the United States.

You are doubtless curious to know how basis schedules are constructed. Possibly your studies may have

taught you before this (if not, your experience will later on) that such order and system as man has been able to establish is the result of comparison. We know things by comparing them with other things and noting their points of resemblance. Constant comparison, however, is not only tiresome to the mind, but too slow for the practical work of life; so when we once establish points of resemblance between two or more things sufficiently close for our purposes, we call them the same, and thereby relieve the mind from the necessity for future comparisons, for we feel safe in treating them as identities and dealing with all identities as a class, leaving the reasoning faculties free for their endless function of establishing relations among these grouped identities. But identity is an imaginary thing, for, theoretically no two things are absolutely the same. We simply call two things the same if they are the same for the specific purpose we have in view. In our city post-office the man who carries letters from the receiving dump to the distributing tables looks upon all letters as identities, and they are for the end he has in view. To the first clerk all letters that go north, east, south, or west are identities. To the next clerk all letters that are to be sent by a given railway are identities. To the clerks in the postal car all letters that go to a given town on the line are identities. To the postmaster in the town all letters directed to the same postoffice box or individual are identities. It will be seen that "identity" has an entirely different meaning to each of these men according to the end he has in view.

The making of rates requires a similar reasoning

process, and the identities fire insurance recognizes are such as are necessary for its purposes.

It establishes standard towns, graded according to the degree of fire protection, and calls them identities.

It establishes standard buildings—frame, brick, brick-veneered, ironclad, fireproof, etc.—and calls them identities.

It grades mercantile stocks, establishing certain standards, and calls them identities.

It is proper to admit that no two towns or buildings or stocks of a given standard are absolute identities. Like all other identities, they are simply such as are adequate for the purpose in view—just such as every one of you is making or recognizing every minute of your conscious life.

As very few towns or buildings or mercantile stocks conform absolutely to these standards, it is necessary to select the most important, tangible, and definite features of deviation, and establish each of these as an identity by a fixed charge or credit, thus creating another series of standards, from which may ramify still another series of charges and credits for deviations. Thus, let us say, no two skylights or wellholes in a building are the same; hence an arbitrary standard for each is selected and a charge established for it, as well as a scale of charges for deviations. In this way special analysis is applied to each important property class, as dwellings, public buildings, stores, and all the innumerable industrial risks, such as wood-workers, metal-workers, wood- and metal-workers, textile mills, pork houses, flouring mills, etc., etc.; the analysis in each case depending upon the complexity of hazard.

In some classes a few charges and credits suffice; in others they run up into the hundreds.

Again, every risk may derive a share of its hazard from exposing property, and this hazard may range from a mere nothing to a hazard far greater than that of the risk itself. The exposure hazard is computed by a scale of charges which takes into account the hazard that a risk, according to its nature, receives and imparts. These we might call the hazard of attack and defense, with a third factor found in removable property, which modifies its exposure hazard in proportion as it is possible to remove it from the vicinity of a fire either in the building which contains it or in an exposing building.

But before the work of practical rating can begin, it is necessary to dispose of the problem found in the innumerable features of hazard which utterly refuse to be yoked together as separate identities, and in another important series of factors which defy analysis, and hence must be equitably spread over all classes. This difficulty is met by "rounding up" all these isolated or mixed causes into one composite identity which is known as a "basis-rate." A separate basis-rate is established for each important property class, and in most cases several basis-rates for each class, according to the municipal and structural standard under which it comes.

The principal elements of hazard which compose the basis-rate are, let us say, taxes, fixed expense, moral hazard, the residue of exposure hazard which cannot be taken up under existing exposure tables, or analytically treated, as, say, the conflagration hazard found

in cities which, in a manner, makes every village, town, and city a single risk. To these must be added the surplus indemnity secured under blanket insurance by the tax dodgers, and all the innumerable unanalyzable causes which start fires of known and unknown origin, as greasy rags, chemical combinations, Fourth of July balloons, Christmas trees, mice, matches, etc., etc. All these things lie outside the pale of analysis and refuse to be established as identities, but logic tells us that as a composite group they bear a constant, if vague, relation to the average hazard of each class; for it is a known fact that certain of these things under some unknown law gather about any given species of property, and this fact enables rating experts to estimate the sum of hazard found in these causes incident to each and every important class of property. In this way another series of identities is established in what are known as basis-rates. Though we know that the hazard embodied in each of these basis-rates is not the same in any two risks, the identity is adequate to the purpose in view. From this you will see that the basis-rate is a something—call it a catch-all, composite, residuum, nucleus, or what you will—of undifferentiated hazard.

You ask: How is it possible to guess within gunshot of the relative hazard of all these things? In reply to this I can only say that the intuition born of experience and conference enables underwriters to establish basis-rates with an accuracy that is as notable, perhaps, as the intuition which enables your professors of paleontology to look at a thigh bone, tooth, or footprint and tell you when and where the animal lived,

what it ate, its habits and race history. Similar intuition is found in nearly every business and art, from the man who will tell you within a few pounds the weight of a steer "on hoof," or the mechanic who, with a pair of calipers, can feel a difference in diameter of less than one-thousandth of an inch, to the art connoisseur who on sight of a dingy canvas can tell you its school, its era, and in many cases name the long-dead artist who painted it.

It has been the constant effort of the lawmakers in Populistic states to kill schedule-rating, on the theory that anything that establishes a common selling price for competitors is in the nature of a trust; but fire insurance renders a service for which it must impose a tax, and the basic theory of every tax is equity in assessment. No one has volunteered to show how the fire tax may be fairly assessed in any way other than through schedules. Open competition simply fixes the tax with reference to the financial standing or personal influence of the owner, without regard to the hazard of the property, and this means favoritism to the financially strong at the expense of the financially weak. Every deviation from the hazard relations established by tariffs proves this fact.

Schedule-rating, even in its present half-developed status, constitutes without doubt the most elaborate and the fairest system yet devised for assessing a tax with practical as well as theoretical equity—an equity in which the hazard of the thing insured is alone considered, regardless of the person behind the thing. But it would be idle to claim that it is a complete, or even, as far as it goes, a perfect system.

From what has been said you doubtless realize that, as a system, schedule-rating consists of the establishing of relations in hazard; that it deals with a complex problem of relativity. Year after year there is an unending succession of changes in the loss and expense ratio, which together constitute the cost ratio of fire insurance; and there is an imperative necessity that rates shall be changed with some regard to the fluctuating cost of the thing sold. The present tariff system makes no provision whatever for making these changes in rates. It is simply a system of static relations. To make rate changes it is necessary to construct new basis schedules, which are merely a congeries of untried suppositive relations, and then apply these schedules in making hundreds, perhaps thousands, of local tariffs. To rerate the entire country in this way is a task of greater magnitude and expense than that of taking a national census. Before these new tariffs can be applied there is almost sure to be a rise or fall in the wave of annual loss, which makes the new rates either too low or too high. There is no assurance that, when they become effective, the new rates will fit existing conditions any better than the old rates. If too high, there is a revolt on the part of the public, and an immediate growth of mushroom competition which makes it necessary to begin at once the work of daubing the new tariffs with competitive rates. These competitive rates, from their nature, are out of alignment with other rates, and, as they multiply, soon destroy all relativity as well as all fairness in the tariffs. Again, high rates generate preferred classes, which are greedily sought by companies willing to pay high commissions, and this leads inevitably to a permanent increase in the expense ratio, which must ultimately be made good by the public. If rates are temporarily too low on some classes, other classes must make good the deficit. If too low on all classes, there is an exodus of insurance capital, until, in a panic, rates are sent skyward by a percentage advance which, unlike the rain, falls harder on the righteous than on the unrighteous; for the man who is already paying the highest rate, relatively, must submit to the largest increase under the percentage advance.

The result of this is that the house of fire insurance is a house undergoing constant alterations and repairs. The hammer and saw of the builder, and the pickax and shovel of the wrecker, never cease their din in the process of schedule-rating and unrating. Anything approaching order, system, or any of their synonyms in this turmoil of creation and destruction is out of the question; even in the last resort of a percentage change, in the absence of any generally accepted definition of classes, it is impossible to describe what groups are to be changed without a long sequence of explanatory circulars, and circulars explanatory of these explanatory circulars. Again, it is as difficult and expensive to lower tariff rates as to raise them.

It is useless to deny that the absence of any provision for the prompt, intelligent, and inexpensive change of rates in fire insurance creates the most perplexing and annoying of the many difficulties which confront American underwriters. If you ask what would remedy this defect, I must preface my reply with the admission that many people by courtesy styled

fire underwriters do not regard it as a defect, for it constitutes their stock in trade—the one thing which enables them to do business.

On the other hand, fire-rating is a sharply differentiated function—as distinct from the numerous other functions of the industry, let us say, as the duties of a railway auditor are distinct from those of a master mechanic or engineer. People who have a comprehensive knowledge of the rating problem are as rare among fire underwriters as expert actuaries among life underwriters. Ask one hundred fire underwriters for an opinion on the subject: ninety-five would probably be found to have no definite opinion, and the other five, views which differ each from the other.

Every leading company maintains for its own information a private classification of property groups, and a ledger account with each of these groups or classes, in which it is charged with its losses and share of expenses, and credited with its premiums. In this way every company is able to segregate its actual experience with each property class, and this constitutes a basis of information for the company in the selection of its individual business.

The theory most agitated at present, perhaps, is that these classification lists should be made uniform, and the combined experience of all companies compiled as a basis of statistical information in establishing rates for each class. The fact remains, however, that the results of such classification would be of no value whatever. The theory *makes no provision for rate changes,* and would leave untouched all the intolerable evils of the present inflexible tariff system.

Again, the information derived from these combined statistics predicated upon constantly changing relations in tariffs would fail to supply any definite landmarks in determining what rate changes ought to be made. The entire plan seems to approach the problem at the wrong end and gives no promise whatever of ultimate benefits. It is an attempt to construct a house without a square, plumb-line, two-foot rule, or other instruments for measuring direction or distance.

The real source of this variance of opinion seems to lie largely in a misunderstanding as to the immediate end sought. While there is room to believe that ultimately the measurement of fire hazard will take its place among the most advanced of classificatory sciences, this must come by evolution. The movement cannot be forced or hurried. The goal of science must be approached by progressive stages, through the adoption one by one of the instrumentalities necessary to the immediate end in view. The first essential is some instrumentality for making rate changes with the promptness necessary to meet the exigencies created by fluctuations in annual cost without a wholesale destruction of tariff standards. This instrumentality is not only an immediate and practical necessity, but seems to be a condition precedent to any progress whatever toward more scientific methods.

Fire insurance has elaborated a system of static relations in its tariffs. It now needs an instrumentality which will enable it to use these relations as standards for measuring the kinetic or movable relations caused by constantly changing conditions. In determining what this instrumentality shall be, it is

proper to say that recent events have conclusively demonstrated:

1. That in every emergency rate changes *must* be made by percentages.

2. That these percentage changes have invariably caused injustice and dissatisfaction.

3. That in every attempt to change rates in this way it has been found almost impossible to describe property groups with sufficient definiteness to establish a common understanding.

Percentage changes cause injustice simply because the principle of relativity in static relations has invariably been ignored. These changes, when applied to logical tariff relations, cannot be otherwise than consistent and equitable, but when applied to tariffs sown thick with untrue relations, injustice results simply because these relations are untrue. As experience has shown that in every emergency rates *must* be raised or lowered by percentages, it follows that shifting and untrue relations in tariffs must give way to permanent and logical relations. When two conflicting conditions confront each other, that which is remediable must succumb to that which is inevitable.

Again, if we seek the reason why nearly every attempt to instruct agents concerning rate changes leads to confusion, we shall find that this difficulty arises from the absence of a clear, concise, and generally accepted definition of property groups—in other words, from the absence of an agreed classification in tariffs which will enable anyone to refer to any class by its designative number so that everybody will understand exactly what is meant.

To sum it up, with a static system already established, it is necessary only to recognize the principle of relativity, and, after once establishing logical relations under this principle, to leave them severely alone (save as actual changes occur in physical hazard), and thereafter make no changes except by percentages from local tariffs in which each risk is designated by its class number. These things, while they would constitute an instrumentality for establishing the flexible rates which have become a *sine qua non,* would, at the same time, constitute a progressive step in placing the tariff system in line with all other methods of scientific measurement, and start it once more toward its ultimate goal as a rigidly scientific solution of the most complicated system of taxation in the world.

If you ask, "What are the prospects of this reform?" I can only cite you to the interesting historical monograph known as Charles Lamb's *Dissertation on Roast Pig.* The story, as I remember, is substantially as follows:

In the early days in China it was the fashion to eat meat raw. One day a house caught fire in the absence of the owner, and roasted a litter of pigs. On his return, in the attempt to drag one of the bodies out of the ash heap, he burned his fingers, and instinctively thrust them into his mouth to relieve his pain. The event was historical, for it was the first time John Chinaman ever tasted roast pig. The consequences were momentous, for it is hardly necessary to say that he found it good. After devouring the entire litter, the happy discoverer at once proceeded to build

another house and roast more pig, and he repeated the process until his numerous adjustments with the fire-insurance companies began to create suspicion. He was shadowed and his secret discovered. It was not long before all China was eating roast pig. The fire-insurance companies were thrown into bankruptcy by the dwellings burned in the cooking process. It was many generations before a brilliant genius discovered the great economic fact that a pig could be cooked without burning a house, but when he began to preach this doctrine from the housetops, he was looked upon askance as a dangerous innovator, and, after being repeatedly bastinadoed, he was finally shut up in a house, and, with a fine sense of humor, cooked in the prevailing style.

Schedule-rating has advanced to a point where it is possible to make a rate, but it has not yet become possible to change it without destroying an edifice. As it took many generations for the Chinaman to discover the great economic truth that pigs may be roasted in a fireplace or cook stove without burning a house, it is perhaps not unreasonably optimistic to hope that at some time in the distant future it may be revealed, as by an inspiration, that a rate may be "done to a turn" through a simple instrumentality, which, like the fireplace and cook stove, will do the work and spare the rating edifice.

I have dwelt possibly too long upon the *pros* and *cons* of the rating problem, with the desire to give you an idea of the range and complications of at least one of the many controversies which, like the great political issues of American politics, are always raging

among fire underwriters—controversies which are always stirring up a tempest in the teapot of fire-insurancedom.

I have frankly admitted the defects in the present tariff system, in the hope that you will believe me equally truthful in describing the many things which redound to the credit of American fire underwriters.

Time will not permit me to explain the numerous and interesting problems found in the expense item of fire insurance which constitutes about 40 per cent. of the entire disbursements of the companies. It is proper to say, however, that independent companies, which acknowledge no restraint outside of their own will, exercise a constant and irresistible influence in increasing the average expenses of the industry through high commissions, and that this increase falls directly upon the policy holder; yet many states have gone so far as to forbid any associated effort even in reducing expenses, all of which goes to show that the old man was right when he said: "My son, go forth and learn with how little wisdom the world is governed."

It may be said without qualification that the minimizing of fire waste and the reduction of expenses are, and always have been, the dominant motives—in fact, the very *raison d'être*—of fire-insurance associations. These associations have been the kindergarten, common school, academy, and university of fire insurance. They have embodied the educational curriculum of fire underwriters, and their educative influence has radiated far and wide upon the great public. They have taught communities how to organize fire departments, how to formulate municipal laws

for the repression of fire waste, how to handle inflammables with the minimum of danger, how to construct safe buildings, how to use electricity intelligently; and last, but not least, in doing these things they have shown policy holders how to secure an immediate and commensurate reduction in their rates; for this reduction is offered by every tariff; indeed, it might truthfully be claimed that the fire-insurance tariff in its direct results—pecuniarily, at least—is the most profitable text-book ever offered to the American public. All these things, which are certainly *pro bono publico,* are the aim and end of fire-insurance associations, and there is no possible way to secure these things except through associated effort on the part of people who make the study of the fire hazard their life-work.

I have tried to put a girdle around the world of fire insurance in forty minutes, and though I have doubtless taxed your patience, I fear I have given you but a vague conception of its complex phenomena. I trust, however, that I have succeeded in showing you that it is a little world in itself, teeming with life, tossed hither and yon by contending opinions; a world in the throes of an evolution dominated by environment; a world where law is slowly struggling out of chaos into order; a world in which the centripetal spirit of the hive is struggling with the centrifugal spirit of the *ego;* a world of problems and mistakes; and last, but not least, a world whose government is neither autocratic nor oligarchic, but communal. There can be no correct understanding of fire insurance without a full recognition of the fact

that its phenomena emanate from a community in which every individual has a voice and an influence.

Fire insurance as an activity occupies the unique position of being an undefined industry. The convention that framed our national constitution left it out in the cold as a thing unworthy of notice. Courts, legislative bodies, and executives seem to have no definite idea of its relational nature as compared with other industries. Everybody seems content to know what it is not. The courts have decided that it is not commerce. Uncle Sam, who seems disposed to father everything else, regardless of sex, color, or previous condition, has disowned it. It is unpanoplied by Columbia's shield. The American eagle does not spread his wings over it, and knows it not, except to give it a peck now and then when he wants it to disgorge revenue. The glorious stars and stripes have never been riddled in its defense; and when the fire-eating Fourth of July comes around with his "rockets, red glare, and bombs bursting in the air," it quakes in mortal terror, for it knows from sad experience that these things, though fun for the boys, are death to underwriting profit.

Finally, fire insurance seems to offer at every turn a curious and stubborn reversal of cause and effect. A celebrated mathematician once wrote a nonsense book for children which purported to give the adventures of a little girl in a looking-glass world where everything was seen inverted by reflection. Fire insurance presents an interesting analogy to this looking-glass land, for not infrequently we find that what we supposed to be north is south; east often turns out to be west; and when we put forth our

right hand, we are as liable as not to prod it on the wrong side. This curious reversal of relations often leads to absurd *non sequiturs* when legislative wisdom attempts to regulate it; and by legislative wisdom I mean the wisdom inside as well as outside of the industry, for fire underwriters themselves are most earnest and persistent Solons; indeed, I hardly know one who does not carry about his person some legislative panacea warranted to set everything to rights.

The French Academy, when engaged in constructing a dictionary, agreed upon the following definition of the word "crab": "a small red animal that walks backward." When this definition was submitted to an eminent naturalist for criticism, he said it was all right with three exceptions: first, a crab is not an animal; second, it is not red; third, it does not walk backward. Perhaps we need a naturalist to tell us what fire insurance really is. It has been ingeniously suggested that it represents the feminine principle in the business world, and it is claimed with some show of reason that this theory is supported by its topsy-turvy logic in which conclusion leads to premise rather than premise to conclusion.

You will soon be going forth into this world "of sixes and sevens" to take your part in making humanity behave itself. I feel confident you have aspirations in this direction—we all have.

You may become jurors, judges, or, if you are especially virtuous, even members of the city council or state legislature. I trust these and even greater honors may be in store for you, but I venture to warn you to consider well before you attempt to regulate

anything so essentially feminine as "the handmaiden of commerce"—fire insurance.

You may develop abnormal abilities as leaders of men. You may be able to control your children, manage your servants, drive your horses, make your hens lay where they prefer to set. You may be able to control your facial muscles so as to look ingenuous when disingenuous, or wise when otherwise; but in closing, as a veteran who has had a long experience with both, I adjure you, as you value domestic harmony, go slow in asserting your authority with your wife or fire insurance. Right or wrong, the helpmeet of man and the handmaiden of commerce will work out their own destiny, and any wrong inflicted on either will, like chickens, come home to roost. Both embody the eternal mystery of femininity, and when you think you know them best you know them the least.

Amiel's definition of one will answer perfectly for both:

> She never speaks out her whole thought. What she knows of it is but a part of what it really is. Complete frankness is impossible to her, and complete self-knowledge seems to be forbidden to her. She has no need of perfidy, for she is mystery itself. She is something fugitive, irrational, indeterminate, illogical, and contradictory. . . . . Capable of all kinds of devotion and all kinds of treason, a sphinx incomprehensible raised to the *n*th power, she is at once the mistress and the servant, the aggravation and the consolation, of man.

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